User's manual

MULTI INPUT MODULE FOR OVERVIEW D

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Revision sheet

To:

- **BARCO Control Rooms GmbH**
  An der Rossweid 5, D-76229 Karlsruhe
  Phone: +49-721-6201-0, Fax: +49-721-6201-298
  E-mail: docu.de.bcd@barco.com, Web: www.barcocontrolrooms.com

From: _____

Date: _____

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1 Introduction

This chapter explains the structure of the manual itself and the used typographic styles and symbols. Safety information is provided concerning the operation of computer systems from Barco.

1.1 How this manual is organized

This section explains the structure of the manual itself and the used typographic styles and symbols. Safety information is provided concerning the operation of computer systems from Barco.

- **Introduction**
  explains styles and symbols of this manual
- **Installation**
  explains how the Multi Input Module is installed (in a 50"system).
- **Summary**
  gives an overview about the features of Multi Input Module
- **Operating**
  describes operating the Multi Input Module an explains the OSD
- **RS232 Remote Control**
  explains cabling and settings of the RS232 Remote-Control, introduces the syntax and lists the available commands
- **Input Selection Tool**
  introduces and explains the graphical user inter face Input Selection Tool for switching the inputs
- **Technical Data**
  gives tabular overviews about the technical details the Multi Input Module
- **Troubleshooting**
  give advice in case of mal function and lists the hotline address
- **Tips and tricks**
  give some useful hints about spanning up sources
- **Appendix**
  lists the tested input sources and shows all types of RCU

Chapters, pages, figures and tables are numbered separately. Chapters are indicated by a »point syntax«, e. g. **4.2.3**, pages by a »dash syntax«, e. g. **2-1**, as figures and tables are, e. g. **figure 5-4**.

1.2 Styles and Symbols

The typographic styles and the symbols used in this document have the following meaning:

Bold	Labels, menus and buttons are printed in **Bold** font.
Condensed	Links to both other chapters of this manual and to sites in the Internet are printed condensed. In the on-line version of this manual all hyperlinks appear teal.
`Courier`	Names of files and parts from programs are printed in the `Courier` font.
`Courier bold`	Inputs you are supposed to do from the keyboard are printed in **`Courier bold`** font.

If you do not heed instructions indicated by this symbol there is a risk of damage to the equipment!

If you do not heed instructions indicated by this symbol there is a risk of electrical shock and danger to personal health!

If you do not heed instructions indicated by this symbol there is a risk of damage to parts, which are sensitive towared electrostatic charge!

If you do not heed instructions indicated by this symbol there is a risk to get harmed by sharp objects!

If you do not heed instructions indicated by this symbol there is a risk that parts may explode!

If you do not heed instructions indicated by this symbol there is a risk that hot parts impact persons or objects!

The sheet icon indicates additional notes.

Next to this icon you find further information.

This arrow marks tips.

Next to this icon you find important notes.

1.3 Safety Instructions

This section describes safety precautions, which must be observed when installing and operating a product from Barco.

1.3.1 Standards

Safety Regulations

The equipment is built in accordance with the requirements of the international safety standard IEC 60950-1, **UL** 60950-1 and CSA 22.2 No 60950-1-03, which are the safety standards of information technology equipment including electrical business equipment.

The safety standards of information technology equipment impose important requirements on the use of safety critical components, materials and isolation, in order to protect the user or operator against the risk of electric shock and energy hazard, and having access to live parts.

Safety standards also impose limits to the internal and external temperature rises, radiation levels, mechanical stability and strength, enclosure construction and protection against risk of fire.

Simulated single fault condition testing ensures the safety of the equipment to the use even when the equipment's normal operation fails.

1.3.2 General safety instructions

- All the safety and operating instructions should be read before using this unit.
- The operating instructions manual should be retained for future reference.
- All warnings on the device and in the documentation manuals should be adhered to.
- All instructions for operating and use of this equipment must be followed precisely.

1.3.3 Installation

Installation and preliminary adjustments should be performed by qualified Barco personnel or authorized Barco service dealers.

1.3.3.1 Power Connection

This product should be operated from an AC power source. Power input is auto-ranging from 100V to 240V.

Check the power rating on your outlet before connecting the devices to the wall outlet or to a power strip. Contact your facilities manager or a qualified electrician if you are not sure what type of power is supplied to your building.

All equipment in the system is equipped with a 3-wire grounding plug, a plug having a third (grounding) pin. This plug will only fit into a grounding-type power outlet. This is a safety feature. If you are unable to insert the plug into the outlet, contact your electrician to replace your obsolete outlet. Do not defeat the purpose of the grounding-type plug.

The devices are designed to operate with single-phase power systems having a grounded neutral conductor. To reduce the risk of electrical shock, do not plug into any other type of power system.

Use only the power cord supplied with your device. While appearing to be similar, other power cords have not been safety tested at the factory and may not be used to power the projector. For a replacement power cord, contact your dealer.

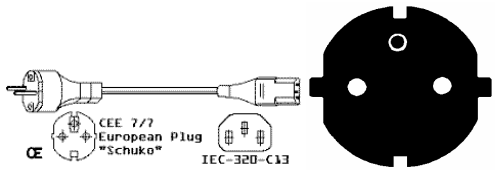
If an extension cord is used with this product, make sure that the total of the ampere ratings on the products plugged into the extension cord does not exceed the extension cord ampere rating.

Also make sure that the total of all products plugged into the wall outlet does not exceed 15 amperes.

A. Mains lead (AC Power cord) with CEE 7 plug:

The colors of the mains lead are colored in accordance with the following code:

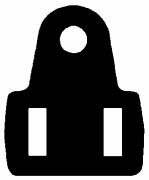
Green-and-yellow:	Earth (Ground)
Blue:	Neutral
Brown:	Line (live)



B. Power cord with NEMA 5-15 plug:

The wires of the power cord are colored in accordance with the following code:

Green or Green/yellow:	Earth (Ground)
White or blue:	Neutral
Black or brown:	Line (live)



1.3.4 Placement

Place the device in a well ventilated area away from sources of ignition and out of direct sun light. Never expose this product to rain or excessive moisture

Slots and openings in the cabinet and the back or bottom are provided for ventilation; to ensure reliable operation of the product and to protect it from overheating, these openings must not be blocked or covered.

Exposing flammable or combustible materials into close proximity of this device could result in the spontaneous ignition of that material, resulting in a fire. For this reason, it is absolutely necessary to leave an "exclusion zone" around all external surfaces of the device whereby no flammable or combustible materials are present. The exclusion zone must be not less than 10 cm (4").

- Do not allow anything to rest on the power cord. Do not locate this product where persons will walk on the cord.

1.3.5 Operation

Barco products are designed and manufactured to meet the most stringent safety regulations.

During operation, the equipment radiates heat on its external surfaces and from ventilation ducts, which is both normal and safe.

- Do not cover the equipment with any material while the equipment is in operation.
- Do not block the cooling fans or free air movement under and around the device.
- Keep flammable and combustible materials away from the device at all times.

In the event of fire, use sand, CO2, or dry powder fire extinguishers; never use water on an electrical fire.

Do not allow anything to rest on the power cord. Do not locate this product where people will walk on the cord. To disconnect the cord, pull it out by the plug. Never pull the cord itself.

- Never push objects of any kind into this product through cabinet slots as they may touch dangerous voltage points or short cut parts that could result in a risk of fire or electrical shock.
- Never spill liquid of any kind on the product. Should any liquid or solid object fall into the cabinet, unplug the set and have it checked by qualified service personnel before resuming operations.

Adjust only those controls that are covered by the operating instructions since improper adjustment of the other controls may result in damage and will often require extensive work by a qualified technician to restore the product to normal operation

Lightning - For extra protection for this video product during a lightning storm or when it is lift unattended and unused for a long period of time, unplug it from the wall outlet. This will prevent damage to the unit due to lightning and AC power-line surges.

1.3.6 Maintenance

Please refer to the maintenance instructions in the user's manual! Do not perform other maintenance work than explained in the user's manual!

1.3.7 Servicing

Never open the case of a device without first disconnecting the power supply cord! Measurements and tests with an opened device may be carried out only in the factory or by specially trained personnel, due to the dangers of electrical shock.

Do not attempt to service this device yourself, as opening or removing covers may expose you to dangerous voltage potential and risk of electric shock! Refer all service to a qualified Barco service center.

Always have service performed on this product by authorized Barco service personnel. Always insist on genuine Barco replacement parts. Never use non-Barco replacement parts as they may degrade the safety of this device.

Call for service in the following conditions :

- When the power cord or plug is damaged or frayed.
- If liquid has been spilled into the device.
- If the product has been exposed to rain or water.
- If the product does not operate normally when the operating instructions are followed.
- If the product has been dropped or the cabinet has been damaged;
- If the product exhibits a distinct change in performance, indicating a need for service.

When replacement parts are required, be sure the service technician has used original Barco replacement parts or authorized replacement parts which have the same characteristics as the Barco original part. Unauthorized substitutions may result in degraded performance and reliability, fire, electric shock or other hazards. Unauthorized substitutions may void warranty.

Upon completion of any service or repairs to this unit, ask the service technician to perform safety checks to determine that the unit is in proper operating condition.

1.3.8 Unpacking of Devices

Note advises on the packaging for unpacking!

1.3.9 Modification of Devices

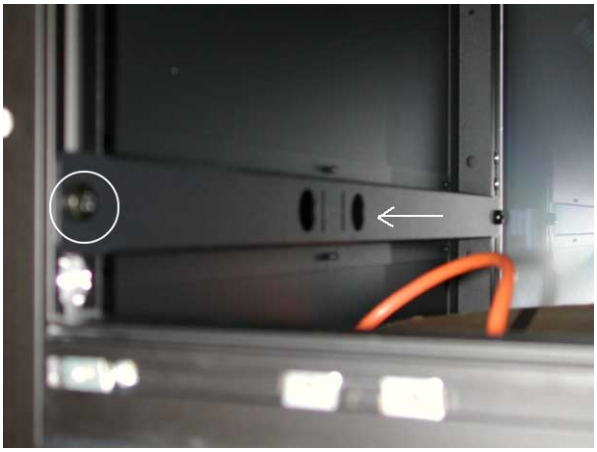
Mechanical or electrical modifications must not be made to the devices. Barco is not liable for damages resulting from modified devices.

2 Installation

The Multi Input Module will be installed into the dark box, all cables guided inside the system. This chapter describes how an OverView D systems without Multi Input Module is upgraded with this unit.

2.1 Installing the support of the Multi Input Module (50")

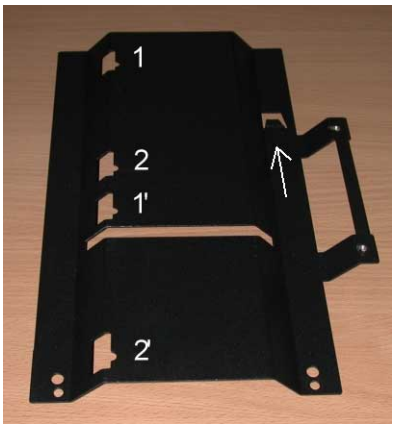
To install the Multi Input Module, the top rear cover [1] of the system has to be removed. Use a torx key size 10 to remove the sheet metal.



When the sheet metal is removed, on the left side of the darkbox you see the enforcement metal. The support for the Multi Input Module will be fixed to this enforcement. Unscrew the screw shown in the picture.

Into the vertical profile, a movable nut has to be inserted.

Look at the support of the Multi Input Module. It has a "nose" which will have to be fit into the hole of the enforcement metal indicated by the arrow. In addition, it has 4 spares, labeled 1-1', 2-2'. For internal installation of the Multi Input Module, the unit will be hooked into the spares 1-1'. The lateral front edge of the Multi Input Unit will fit into the slot of the support.



Insert the support. Fit the nose into the enforcement metal. The support of the Multi Input Module will be fixed on the bottom by means of the screw you previously loosend, and on the top by an additional screw which will be tightened using the nut inserted into the profile.

After the support has been attached, the IR sensor for operating the Multi Input Module via IR remote control has to be installed.

2.2 Installing the support of the Multi Input Module (67")

Installation of the support of the Multi Input Module in a 67" structure is about the same as for the 50" systems. The main difference is that there is no need to fit the "nose".

Remove the rear cover of the structure.

The fixation material for 67" are the two short hammerbolts included in the installation kit. Insert the two hammerbolts:

Subsequently the hammerbolts are inserted into the left vertical profile (seen from behind). Fix the support about 50mm above the bottom connection bracket:

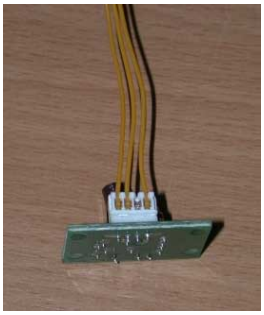
After the support has been attached, the IR sensor for operating the Multi Input Module via IR remote control has to be installed.

The steps described in the following chapters are the same for 50" and 67" inch systems and therefore only explained once (50" system.)

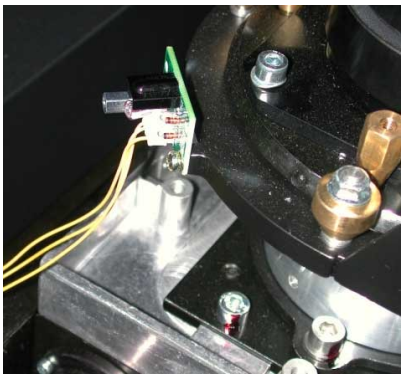
2.3 Installing the sensor of the Multi Input Module

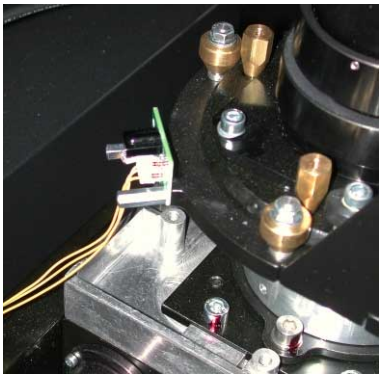
The IR sensor of the Multi Input Module will be placed upon the IR sensor of the projection unit. Therefore it comes with two fixation facilities.

Before installing the sensor, plug in the cable! Mind the correct orientation! For better recognition, the socket NOT to be connected to the sensor (but to the Multi Input Module) is painted black:



One by one, replace the fixation screws of the IR sensor of the projection unit by the fixation facilities of the sensor of the Multi Input Module. In the picture, you can see the required steps: replace one screw, then the other, finally attach the second sensor on top of the IR sensor of the projection unit. Make sure not to block the sensor of the projection unit by a wrong attachment of the IR sensor of the Multi Input Module!





Since the back side of the unit is no longer accessible when the unit is installed, the power cables to and the sensor cable have to be connected to the Multi Input Module BEFORE inserting the unit into the darkbox.

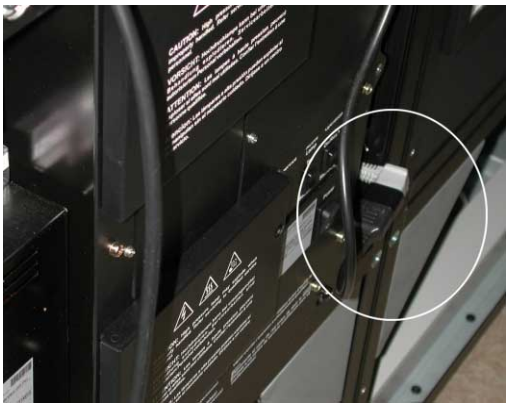
2.4 Cabling of the Multi Input Module and installation of the unit

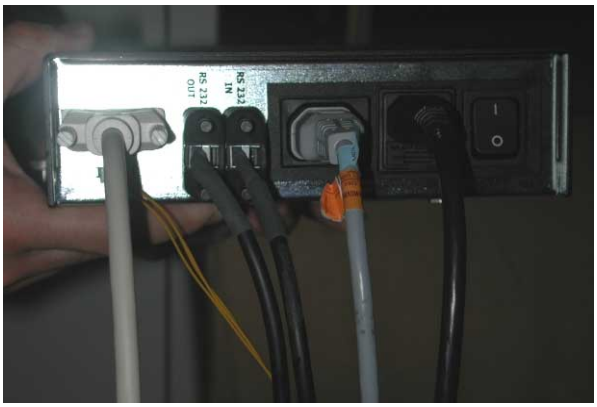
The power cable of the illumination unit has to be unplugged and lenghtened by the extension cord. The second interface of the extension cord has to be connected to the power in socket of the Multi Input Module.

The power out socket of the Multi Input Module has to be connected to the illumination unit.

The sensor cable has to be plugged in, as well as the remote control cables and the data cable (DVI) to the projection unit.

Make sure to guide all cables inside the dark box!





Now you can insert the Multi Input Module into the dark box. Tilt it to enable the insertion and put it up only when inside the dark box.

Hook the two rods on the bottom of the Multi Input Module into the spares 1-1' of the support.

Tighten the curled screw on the bottom of the Multi Input Module. That's it. No additional fixation is required.

Now the cabling of the sources (front interfaces can be done. When all cables are connected, carefully guide them through the dark box. Make sure that they are not within the range of projection – otherwise you will see the cables on the screen!

When all cables are attached, switch on the Multi Input Unit and test it. Subsequently re-attach the top rear cover of the OverView projection system.

3 Summary

This chapter gives an overview about the features of the MULTI INPUT MODULE.

3.1 Features

The MULTI INPUT MODULE for OverView D series provides a set of interfaces to connect all common RGB, Video, DVI, and SDI signals and to display them at the respective OverView D projection module.

The source will be displayed full screen on the respective projection module. It is not possible to have it displayed in a window and/or to move it on the Display Wall.

The MULTI INPUT MODULE features an OnScreen Display to select the source and to adjust the parameters. The On-Screen Display is operated via an IR Remote Control.

Superior composite video performance, the capability to process all known (and unknown) VGA timings and formats, with every possible sync type, guarantees perfect satisfaction in most applications.

3.2 Applications

3.2.1 Display of Video/RGB sources

Select the MULTI INPUT MODULE to display a RGB/Video source full screen on a projection module.

Please mind: For OverView DR+ (SXGA+ resolution), the possible input resolution of signals to be scaled is restricted to SXGA and lower. Sources with resolutions SXGA+ can be displayed 1:1, sources with resolution higher than SXGA cannot be displayed on an SXGA+ projection module.

3.2.2 Redundancy option

Select the MULTI INPUT MODULE for a redundant configuration: The display wall controller is attached to the standard DVI-I input and the sources to be displayed directly on analog inputs (RGB inputs, video inputs). Upon controller failure, the sources are still displayed on the display modules, scaled up to each cube size: no loss of information.

3.3 Interfaces

3.3.1 Front side

Figure 1
interfaces of the Multi Input Module (front side)

Input	interface
Video 1	Cinch (FBAS)
Video 2	Cinch (FBAS)
S Video	Mini DIN 4pol (S-Video, Y/C)
RGB	15pol HD SubD receptacle (R/G/B/Hsync/Vsync)
DVI IN	DVI-I input
SDI IN/OUT	SDI input (optional)

3.3.2 Rear side

Figure 2
interfaces (rear side)

Item	description
1	power switch, 1= On, 0=Off
2	AC power input
3	AC power output
4	RS232 IN (D9)
5	RS232 OUT (D9)
6	IR sensor
7	DVI D OUT

3.4 Power connection

In case you use the Multi Input Module with a 200W illumination unit, connect the AC In of the Multi Input Module with the AC out of the illumination unit. In this case do NOT use the power outlet of the Multi Input Module!
In all other cases (IU 100W, IU120W) proceed as described below!

The Multi Input Modules comes with two power cords: one to lengthen the power cable of the illumination unit, and one to connect the Multi Input module with the illumination unit.

Unplug the power cable from the illumination unit. Since this cable is too short to be connected to the Multi Input Module, use the extension cord to lengthen it. Plug it into the power input [2] of the Multi Input Module.

Connect the illumination unit to the power output of the Multi Input Module [3] by means of the other cable.

The power output is live as soon as the connection to the wall outlet is established.

3.4.1 Switching On

The power switch of the Multi Input Module only switches the functionality of this module. It has no impact on the power supply of the illumination unit: the power output of the Multi Input Module where the illumination unit is connected is live as soon as the Multi Input Module is connected to the wall outlet.

Use the power switch[1] to switch on the Multi Input Module.

The sequence of switching on the system (projector, Multi Input Module, sources connected to the Multi Input Module) does not matter.

3.4.2 Fuses

The fuse is located beneath the AC power input and is of Type T 4 AH / 250V

Always replace with the same type of fuse!

3.5 Input Connections

The Multi Input Module has multiple input connections for all common RGB and video sources. The active input can be selected using the cursor key on the IR Remote Control and the OSD or Input Selection Tool.

3.5.1 Video Input

There are two cinch connectors to connect a composite video, labeled Video1 and Video2.

The following signals can be connected to these connectors:

- Composite video signals from a VCR, etc.

Composite Video is a single video signal that contains luminance, color and synchronization information.

3.5.2 S-Video Input

Connect an S-Video source to the 4 sub Mini-Din interface labeled S-Video.

The following signals can be connected:

- Separate Y-luma/C-chroma signals for higher quality playback of Super VHS-signals.

Pin configuration mini DIN plug:

1	ground luminance
2	ground chrominance
3	luminance 1.0Vpp ± 3 dB
4	chrominance 282 mVpp ± 3 dB

3.5.3 DVI-I input

Slot 5 provides a single link DVI I input.

- Connect one channel of the dual channel UGX graphics card to this input

3.5.4 Serial Digital Input / Serial Digital Output (optional)

If required, the Multi Input Module can be extended by a SDI interface.

The input is always 75 Ω terminated. The output impedance of the SDO is 75 Ω.

This avoids the need for analog processing anywhere in the video production chain and guarantees the ultimate image quality.

3.6 Communication Connections

The following communication connections are available:

- RS232 in / RS232 out.
- IR to plug in the IR sensor to

3.6.1 RS232 in / RS232 out

To connect a computer, e.g. IBM PC (or compatible), Apple Macintosh to the RS 232 input of the Multi Input Module to allow communication between the computer and the Multi Input Module. Via this connection the Multi Input Module can be RS232 remote-controlled.

Connect the shorting plug to shorten the RS232 output.

3.6.2 IR

The IR sensor to enable the communication with the IR Remote Control unit is plugged to this input. Please mind the correct orientation of the cable!

3.7 IR Remote Control

The Multi Input Module is operated by means of an IR Remote Control.

Figure 3
IR Remote Control

Item	description
1	**On/off** button, also used for re-programming
2	**OK** button to enter the OSD, to exit a sub menu and/or to close the OSD
3	Up key
4	Right key
5	Down key
6	Left key
All other keys	No function (except the numeric keys when programming the IR, see below)

To program the IR remote control, press the following keys in the described sequence:

- **simultaneously press the On/Off + OK key for 3 seconds**
- **Use the numeric keys, and enter the code 2 7 0**
- **Press On/Off again.**

For confirmation, the On/Off key will blink 3 times

This instruction can also be found on a label on the back of the IR remote control unit.

3.8 Adjusting black level and white level for analog signals

Only authorized personnel is allowed to perform these adjustment procedures.

These adjustments require the access to a hidden menu of the OSD. The commands to switch to and from the hidden menu are listed in two script files, the **Systemmenu.txt** and the **ColorSetup.tx**t. These files can be downloaded from KARINtranet (http://karsrv11/products/download/data.asp?search=Input Selection Tool) and then assigned to the buttons of the Input Selection Tool.

Please note:

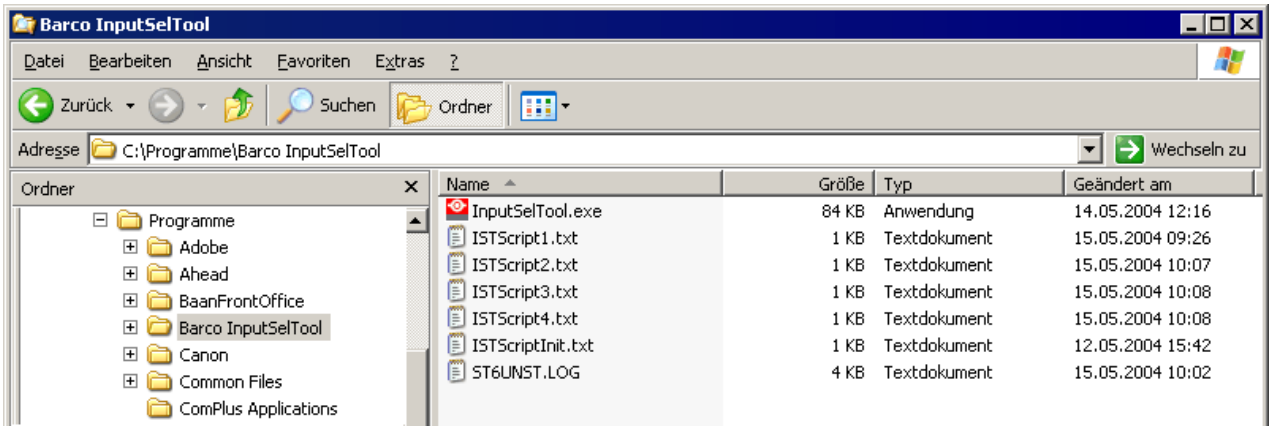
The script files have to be stored in the installation directory of the Input Selection Tool!

A script assigned to the first button has to be saved as **ISTScript1.txt**.

A script assigned to the second button has to be saved as **ISTScript2.txt**, and so on.

The script executed when establishing the connection has to be saved as **ISTScriptInit.txt**.

The names of the files are not case sensitive!

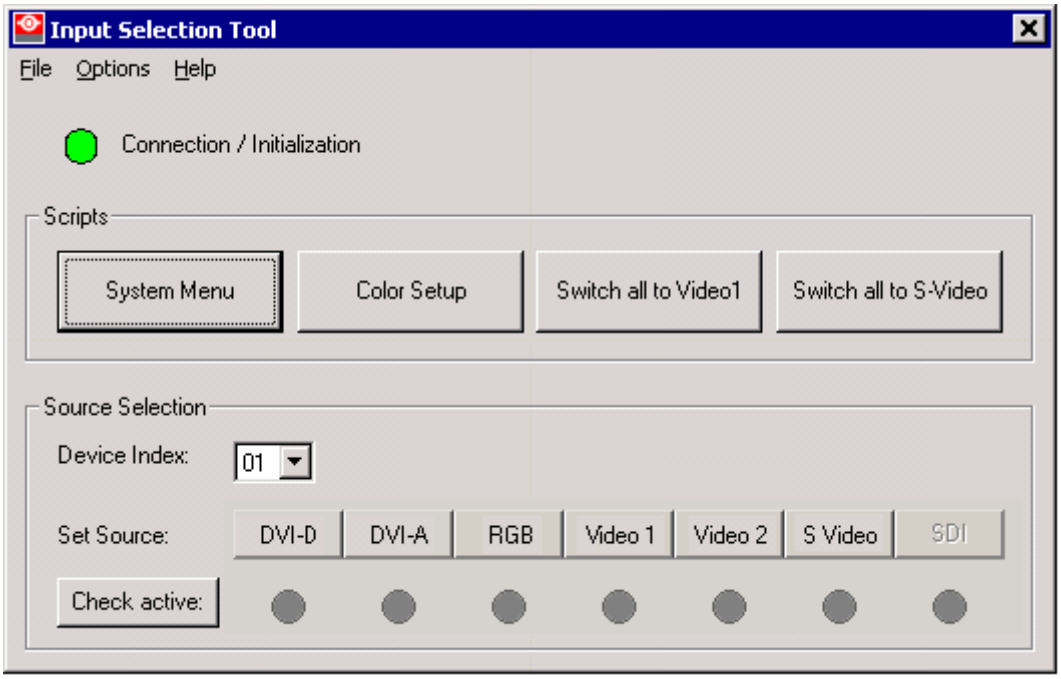


The next steps assume that the script Systemmenu.txt has been renamed and saved as ISTScript1.txt and the script ColorSetup.txt has been renamed and saved as ISTScript2.txt.

The black level and the white level adjustment have to be done for VGA1 and for VGA2!

- Connect the COM-port of Notebook to the RS232 In interface of the Multi Input Module.
- Connect the VGA out of the Notebook to VGA1 (VGA2) of the Multi Input Module.
- Start a color test program (e.g. Ntest from Nokia).
- As test image, use a black background with a white center box.
- Feed the test image to VGA1 and select VGA1 to be the active input.
- Start the Input Selection Tool.

You will see the button with the caption **System Menu** (to switch on the standard user menu) and the button with the caption **Color Setup** (to switch on the access to the hidden menu for black level and white level adjustment).



Press the **Color Setup** button. This will activate the access to the hidden menu.

Now press the left key on the Remote-Control Unit to start the hidden menu **Color Setup**.

With the Color Setup menu active, the gamma table of the signal is disabled, and the output mode uses only three color values: black, gray, white. This makes adjustment very easy.

On the **OSD**, a dialog pops up.

The following table lists the entries of the dialog and their description:

Entry	description
VGA1	If the signal is connected to VGA1, this option shows a white dot
VGA2	If the signal is connected to VGA2, this option shows a white dot
B&W	Black and White (not used)
Brightness	Actual brightness (not used)
Contrast	Actual contrast (not used)
Offset	To adjust the black level
Gain	To adjust the white level
Display	Display white point adjustment (not used)

Make sure that you do not select VGA1/VGA2 when the color setup menu pops up. This will re-activate the actual gamma of the signal, and you will have to exit the Color Setup Menu (press OK) and to re-enter it again (press the left cursor key)

- Use the up/down cursor key to select **Offset** (to adjust the black level)**.**
- Press the right cursor key to activate it.
- A submenu pops up with the entries **Auto**, **R**, **G**, **B**.
- Select **Auto**, and wait until the adjustment is finished.
- **Exit** the **Offset** menu by pressing **OK**.

- Use the up/down cursor key to select **Gain** (to adjust the white level).
- Press the right cursor key to activate it.
- A submenu pops up with the entries **Auto**, **R**, **G**, **B**.
- Select **Auto**, and wait until the adjustment is finished. This takes a bit longer than with **Offset**!
- Subsequently the **R**, **G**, **B** parameters have to be adjusted.

Probably the values for red and blue are smaller than for green. Let's assume to start with red, than proceed with blue, and finally adjust green.

Anyway, the sequence does not really matter!

- Carefully watch the left side of the white test box.
- Select **R** (red).
- Increase the value of red by pressing the right key until red is extended up to the left edge of the white test box!
- Select **B** (blue), and increase the value of blue by pressing the right key until the blue spreads up to the left edge (which means that the most left column of pixels of the "white" box no longer is red, but magenta).
- Select **G** (green), and increase the value of green by pressing the right key until the most left column of pixels of the test box is white.
- **Exit** the submenu by pressing **OK**.
- To apply the adjusted black level and the adjusted white level,
- Navigate with the cursor key to the active input (VGA1 or VGA2, respectively) und press **OK**.
- Apply the NOKIA test pattern. The display should show "nice" colors.

- Finally switch back to the **System Menu** by pressing the button **System Menu** on the Input Selection Tool!

Repeat all steps for VGA2.

4 Operating the Multi Input Module

All the functions of the Multi Input Module are selected and adjusted using an advanced on screen display (OSD) by means of an IR-remote control. The OSD includes an online help window to explain the functionality of the menu items. Direct control via the IR Remote Control is not supported.

4.1 General

The OSD allows easy access to commands for selecting a source and setting its parameters.

The OSD is activated by pressing M on the IR Remote Control.

Menu items which are not applicable are grayed out.

There are also menu items which are not grayed out but don't effect anything due to a missing functionality of this version of the Multi Input Module. Please refer to the menu description to learn more about the available menus and commands.

Adjusted menu items will be saved if

- The sub menu is closed

The selection of an input will be saved whether the sub menu has been closed or not.

4.2 Menu layout

The existence of a submenu is indicated by an arrow:

A selected item is indicated by a dot:

When selecting a menu item a dialog box is displayed with explanations.

4.3 Addressing a Multi Input Module

A Multi Input Module is addressed by means of its address. To assign an address, proceed as follows:

- While the OSD is closed, press the Left key. The System menu is displayed.
- In the System menu, select MTBF | IR Accesscode
- Direct the IR Remote Control unit to the Multi Input Module.
- With the numeric keys on the IR Remote Control Unit (RCU), enter the specific address. This has to be a two-digit value.

Example: to assign the address "3" to a Multi Input Module, enter 03 on the RCU.

To find out the address of a Multi Input Module, enter 00 with the numeric keys on the RCU. Keep in mind that the answer of the Multi Input Module will be only e.g. 3, and not 03.

After assigning an address to a Multi Input Module, you can send commands to only this Multi Input Module by first entering the address and then pressing the respective command key and operating the device via the OSD. All commands and settings will be applied to the Multi Input Module with this specific address.

If you want to address a different Multi Input Module, start your command with the address of this Multi Input Module. Make sure that the previously addressed device realizes this new address. In case it does not realize the new address, e.g. the IR Remote Control access to this Multi Input Module is blocked during entering the new address, it will listen to the commands although it is not intended to do.

The address of the Multi Input Module operated via the IR Remote Control and the Remote Control adress of the same device operated via RS232 Remote Control may differ.

4.4 Navigating

4.4.1 OSD closed

In case the OSD is closed, the keys of the IR Remote Control are assigned to the following actions:

key	Action
UP	Opens the SOURCE menu.
LEFT	Opens the INFO menu
RIGHT	Opens the INPUT GEOMETRY menu
DOWN	Toggles through the inputs: Video1, Video2, S-Video, RGB, DVI
M	Activates the OSD and opens the MAIN menu

4.4.2 OSD activated

In case the OSD is activated, the keys of the IR Remote Control are assigned to the following actions:

key	Action
UP	Select the previous menu item. Wrap around is provided at the first item of a menu.
LEFT	Decrease the actual selected value. Toggle ON/OFF buttons. Select an OPTION button.
RIGHT	Increase the actual selected value. Toggle ON/OFF buttons. Select an OPTION button.
DOWN	Select the next menu item. Wrap around is provided at the last item of a menu.
M	Close the active menu and return to the previous, Exit the OSD

4.5 Activating the OSD

Press the OK key on the IR Remote Control to activate the OSD. The main menu will be displayed.

The main menu includes the following menu items:

- Input Signal
- Geometry (VGA)
- Geometry (Video)
- Picture
- Other

Use the up and down keys to select a menu item.

Press the right key to activate it.

4.6 Input Signal

This menu items gives access to select the desired input source.

No information is given if the input source is actually connected!

Use the **M** key to activate the OSD.

Use the up/down key to select **Input Selection**.

Press the right key to select.

A submenu is displayed which lists the available inputs. The currently active input is indicated by a dot.

Use the up/down key to select the desired source and subsequently press the right key to activate it.

4.6.1 VGA1

This item refers to the source connected to the RGB interface. If this menu item is selected and active, timing information detected on the input is shown:

Item	description
Resolution	Resolution in pixels and in lines
H	Horizontal frequency
V	Vertical frequency
S	Type of synchronization signal: HV: Separate H-Sync and V-Sync H-Comp: Composite video on green: Sync signal is embedded on the green signal H+(V+): active High Sync H- (V-): active Low Sync

This information is also taken to save user adjustments for this timing.

A timing is recognized as "known" according to following rules:

Total vertical lines range: +/- 2
Horizontal frequency range: ~ 1%
Same sync type.

If a source provides more than one sync types the used sync is selected in following order
1st : Separate H Sync and V Sync.
2nd: Composite Sync.
3rd : Sync on Green

4.6.2 VGA2

This "interface" refers to an analog signal connected to the DVI-I interface.

4.6.3 DVI

Select DVI if the source connected to the interface labeled DVI should be displayed (in Control Room applications, usually this interface is connected to the graphical card of the wall controller and therefore the active input)

4.6.4 Video

This menu item gives access to a submenu to select the respective video source out of Video1, Video2, S-Video. Press the left key to open the submenu. A list with video sources pops up:

Item	description
Comp1	Select Comp1 if the video source to be shown is connected to the input labeled Video1
Comp2	Select Comp2 if the video source to be shown is connected to the input labeled Video2
Y/C	Select Y/C if the video source to be shown is connected to the input labeled S-Video
AV	Not available

4.6.5 SDI

Select SDI if the source connected to the interface labeled SDI should be displayed

SDI is only available on request!

4.6.6 Options

This menu item gives access to a submenu to specify the parameters of the active source.

Press the left key to open the submenu.

- VGA Options
  Only shows up if the source connected to the interface labeled RGB is active.
  The following options are available:

Item	description
Auto Sync Detect:	Enables or disables the auto detection of the supplied synchronized signal. Supported sync types are Separete Hsync and Vsync, Composite Sync at H input, Sync on Green. Besides Auto Sync Detection, also manual detection of the sync signal can be selected. Please note: In manual sync type mode no other sync type is detected as the chosen one. If for example composite sync is selected and a sync on green signal is applied, this signal is processed as “no signal”! It might therefore be recommended to select Auto Sync Detect. However, in power saving mode (DPMS) the desired sync type should be selected manually since in some cases, if the source stops, only Hsync and Vsync can be taken as synchronization signal
HV Sync:	manual selection of separate Hsync and Vsync,
Composite Sync:	manual selection of composite sync
Sync on Green:	manual selection of sync on green

Details:	**H-Clamp:**	Horizontal Clamp Place (only for special purposes). *Default value is 8. Wrong settings may cause artifacts!*
	SoG Level	Voltage level for the sync on green comperator *(only for special purposes). Wrong settings may result in "no signal".*
	Coast Lines:	Number of serration pulses. *If the setting is below the number of serration pulses , the picture may be right shifted at the top. Default value is 7.*
	Edge:	H-Sync edge (leading or trailing) for sample rate recovery. *If this item is changed, in case of SoG sync, H-Clamp has also to be adjusted.*
	C-Sync Filter:	Only for SoG or composite sync. *C-Sync Filter specifies a delay time within the C-Sync must be at his active level before V-Sync is detected. The following delay times are related to the settings:* *off: 3.2 µs* *HF: 6.4 µs* *LF: 20.0 µs* *Default value is HF. In some case there are unusual long pulses during the vertical sync time, which leads to erroneous sync separation. In this cases the setting LF may be helpful. If the pulses are really short, the C-Sync filter can be disabled.*
Multisync:	this setting allows to display very unstable signals. *Default value is ON.*	

- Video Options
  This menu is only accessible if a video input (Video1, Video2, S-Video) is active.

Item	description
Source:	Optimize color recovery for VCR, satellite or terrestrial video sources Every video source has a delay between the luminance and the chrominance information.
Auto:	Detection of the video norm PAL, NTSC; SECAM with also their sub standards. Following video norms are supported: PAL, NTSC M, SECAM, NTSC 44, P AL M, PAL N, PAL 60, NTSC Mono 50Hz Mono 60Hz.
Norm:	Shows the norm of the incoming video signal. If Auto is disabled, the desired norm can be selected manually.
Auto Format:	Allows the detection of several 16:9 and so-called "letter boxes" formats. For this formats the top and bottom blacklines are suppressed via vertical expansion.
AV:	Operation modes of the AV plug (not available)

- SDI Options
  This menu is only accessible if a SDI input source is active.

Item	description
Format:	Shows the SDI formats: 625-50Hz, 525-60Hz
SMTP	SMTP, NRZI and DESC(rambing) are options for non-standard applications. Wrong settings may result in corrupt picture or loss of signal
NRZI	
DESC	

- AV
  Not available

4.6.7 Signal

This menu item allows to control the signal management. The following functions can be enabled or disabled:

Item	description
Power On	Use this selection to specify the input which is selected at power on. If the last active input should be selected again, enable LAST
Search	Enables the search of active inputs if no signal is supplied at the current input. This function provides the redundancy option.
Supervision	Enables auto selection of other inputs if new signals are detected. Supervision of inactive inputs is only possible for inputs which are not in the same group as the active input, e.g. if the active input is Video1, no supervision is possible for Video2 or S-Video.

4.7 Frame Geometry

Frame geometry is only available if the active source is connected to the input labeled RGB or DVI. This menu item allows to set all parameters which are related to the size and position of the displayed picture.

4.7.1 Input

This menu items refers to all parameters which describe the incoming picture. This menu can be selected directly by pressing the right key on the IR Remote Control while the OSD is off.

- Pixel rate
  Adjust pixel rate until the whole frame appears the same
- Phase shift
  Adjust phase shift to get the best picture quality
- X-Position
  Adjust horizontal frame position
- Y-Position
  Adjust vertical frame position
- Pixel
  Number of active pixels of the incoming PC signal, e.g. SXGA 1280
- Lines
  number of active lines of the incoming PC signal, e.g. SXGA 1024.
  “I” indicates interlaced signals

- Interlaced

Item	description
Interlaced	Selection of interlaced or none-interlaced input formats.
PC	Optimized de-interlacing for PC-Signals (static mesh).
Sport	Optimized de-interlacing for fast moving RGB video signals (temporal de-interlacing).
Movie	Optimized de-interlacing for less moving RGB video signals (spatial de-interlacing).
Auto Phase	Enabling and time period of automatic phase sensing. This function detects phase distortion +/- 2 steps around the actual phase setting. Note: Correct operation depends on various parameters. Due to this correct functionality could not be guaranteed. Correct operation has to be ensured by testing this function with the target application.

- Auto
  Self adjustment of the following parameters

Item	description
All geometry parameters	
Phase shift	
Contrast	The intention is to adjust signals within an input range between 0.5 to 1V (full scale). You get best results with images of large, full scale, homogeneous areas.
Blackk&white	Not available

4.7.1.1 Recommended procedure to adjust unknown input formats

For pixel rate adjustment a support mode is available. To benefit from this support mode, select “original mode”, cf. Advanced. Subsequently go back to item pixel rate. Now the phase shift is continuously increased from 0 to 31 (with wrap around). One cycle time is around one second.

A detailed look on the display shows following behavior:

The pixel is sampled more than one time if the pixel rate is much too high. In this case decreasing of the pixel rate is recommended.
Attention: while the phase shift is increased form 0 to 31 the x-position changes smooth by one. The overflows from 31 to 0 the results in an abrupt step back to the former x-position. Do not misjudge this behavior with oversampling.

- The pixel disappears if the pixel rate is much too low. In this case increasing of the pixel rate is recommended.
- If the pixel rate is nearly correct, a distortion moves like a “wave” over the picture.
  If the direction of the wave goes from left to right, decrease the pixel rate.
  If the direction goes form right to left, increase the pixel rate.
  In any case if the direction of the “wave” changes you have passed the correct setting.
  Hint: Evaluation is easy with one single pixel in horizontal direction (e.g. vertical line).
- After the pixel rate is correct adjusted change back to original mode and adjust number of pixels, lines and x/y position to get a full screen displayed image.

If there is a unstable picture for nearly every phase setting the quality can be improved by:

- Selecting the other H-Sync edge as reference edge for pixel clock recovery. (cf. Options, VGA Options, Details).
- Adjust SoG Level for Sync on Green signals (cf. Options, VGA Options, Details).

After adjusting SoG level, phaseshift has also to be adjusted

4.7.2 Display

This menu items gives access to adjust all parameters of the monitor geometry.

- Pixel
  Number of active display pixel per line. Maximum possible value is the true display resolution.
- Lines
  Number of active display lines. Maximum possible value is the true display resolution.
- X-Position
  If the active display area is chosen smaller than its real resolution, the horizontal position can be adjusted.
- y-Position
  If the active display area is chosen smaller than its real resolution, the vertical position can be adjusted.
- Mirror
  Enables a mirrored display (H reverse). Due to some scaler restrictions this function is not possible if the vertical downscaler is running, i.e. if there are more input lines than output lines.

4.7.3 Advanced

This menu items allows to select the display modes standard, original, and zoom.

- Standard
  The input signal will be displayed on the entire display
- Original
  The input frame will be displayed in a 1:1 ratio.
  If the input resolution is larger than the display resolution, only a part of the picture is displayed.
  If the input resolutin is smaller than the display resolution, a window is placed in the display.

Item	description
X-Position	Adjust horizontal position of the displayed window
Y-Position	Adjust vertical position of the displayed window

- Zoom
  Magnification of the input frame.

Item	description
X-Factor	Magnifying factor in horizontal direction
Y-Factor	Magnifying factor in vertical direction
X-Position	Adjust horizontal position of the displayed window
Y-Position	Adjust vertical position of the displayed window

4.7.4 Wall

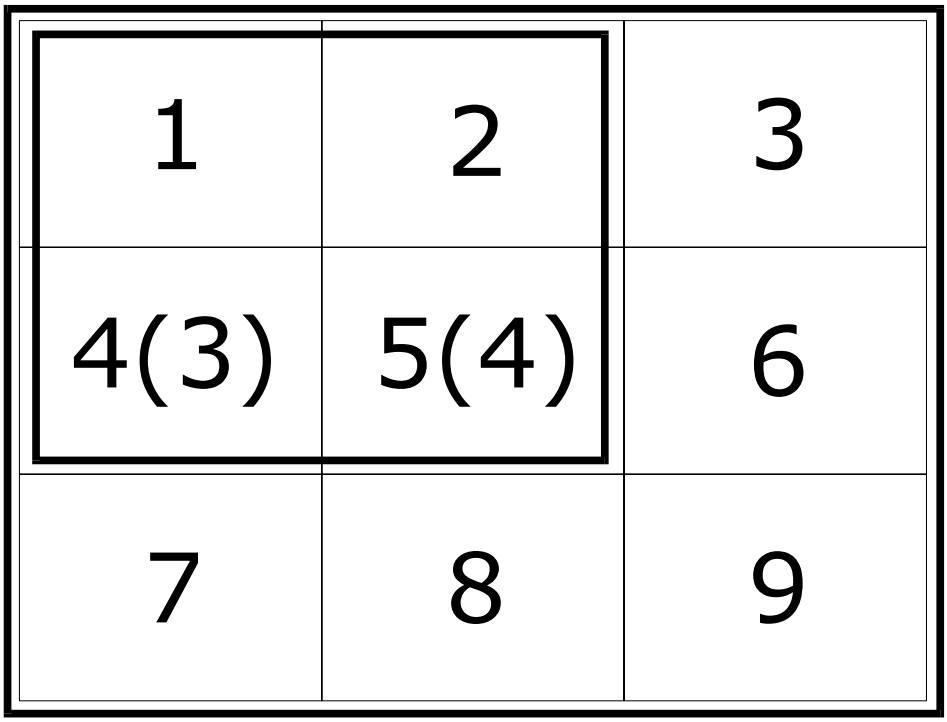
This menu items allows to span a source over multiple projection modules

Item	description
display wall	If this item is not checked, the following settings are NOT applied
Display no.	Number of this projection module *)
Display horizontal	Number of horizontal cubes of the display wall *)
Display vertical	Number of vertical cubes of the display wall *)
Border horizontal	Border of one display in percent of the active width
Border vertical	Border of one display in percent of the active height

*)

The modules are counted from left to right and from top to bottom, seen from front. "Display wall" means the area to be covered by one signal.

The following picture shows two different numbering depending on the "display wall" (display size). For the 2x2 the numbering in brackets applies.



4.8 Geometry (Video)

This menu is only available in Video and SDI mode.

It can be selected directly by pressing the right key on the IR Remote-Control while the OSD is off.

Item	description
Default	Normal display of video input
Zoom 1	Slightly zoomed picture to reduce black lines at the borders
Zoom 2	As Zoom 1, but more zoomed
Settings	Manual adjustments for the picture geometry, cf. Settings. All parameters of the input and output frame can be adjusted. The adjustments are saved according to the actual selected mode Default, Zoom 1, Zoom 2.
Mirror	Enables mirrored display (H reverse). Due to some scaler restrictions, this function is not available if the vertical downscaler is running, i.e. if there are more input lines than output lines.
Sports	Selects de-interlacing with no moving but few flicker artifacts. Best setting for pictures with fast moving contents (like News tickers or some sports games). Technical term: “spatial de-interlacing”.
Movie	Selects de-interlacing with some moving but no flicker artifacts. Also some noise reduction is done in this mode. Best for normal movies. Technical term: “motion adaptive de-interlacing”.

4.8.1 Settings

This menu items opens a submenu to adjust the geometry of the video signal.

- Input
  This menu items refers to all parameters which describe the incoming picture and allows to adjust active pixels, lines, and position.

Item	description
Pixel	Number of pixel of the incoming video signal
Lines	Number of lines of the incoming video signal
X-Position	Adjust horizontal frame position
Y-Position	Adjust vertical frame position

- Display
  This menu items refers to all parameters which describe the monitor geometry.

Item	description
Pixel	Number of active display pixel per line. Maximum possible value is the true display resolution
Lines	Number of active display lines. Maximum possible value is the true display resolution
X-Position	If the active display area is chosen smaller than its real resolution, the horizontal position can be adjusted
Y-Position	If the active display area is chosen smaller than its real resolution, the vertical position can be adjusted

- Zoom
  This menu items allows to adjust magnification factors and picture positions.

Item	description
X-Factor	Magnifying factor in X direction
Y-Factor	Magnifying factor in Y direction
X-Position	Adjust horizontal position of the displayed window
Y-Position	Adjust vertical position of the displayed window

- Format
  This menu items allows to set special parameters for format conversion

Item	description
Parameter 1	Format correction achieved by adding black lines or columns
Parameter 2	Format correction achieved by cropping lines or columns
Parameter 3	Format correction achieved by panorama or waterglass view. Technical term: “anamorphic scaling”

- Wall
  This menu items allows span a source over multiple projection modules.

Item	description
display wall	If this item is not checked, the following settings are NOT applied
Display no.	Number of this projection module *)
Display horizontal	Number of horizontal cubes of the display wall *)
Display vertical	Number of vertical cubes of the display wall *)
Border horizontal	Border of one display in percent of the active width
Border vertical	Border of one display in percent of the active height

  *)
  The modules are counted from left to right and from top to bottom, seen from front. "Display wall" means the area to be covered by one signal, cf. Wall.

- Default
  This menu items resets all geometry adjustments to their factory defaults.

4.9 Picture

This menu item gives access to adjust the following picture settings:

Item	description
Brightness	Brightness of the displayed picture, default value is 32
Contrast	Contrast of the displayed picture, default value is 32
Gamma	Gamma correction factor. Possible values are off, 1.8, 2.2
Color Temperature	Depending on the application, the color temperature can be adjusted to the following values: 3200K (Broadcast) 5600K (Film) 6500K (Video) 7100K (medical applications) 9300K (Computer) User (to adjust the color temperature by means of the R, G, B values, cf. Colors
Sharpness	Adjust scaling algorithm for up-scaling 0: smooth scaling 8: scaling done by pixel doubling
Colors	Gives access to a submenu to select color temperature by means of the R, G, B values, cf. Colors
Backlight	Adjust backlight brightness

4.9.1 Colors

This submenu gives access to adjust the color temperatures by means of the R, G, B values and to e.g. modify saturation.

Sometimes no item of this submenu can be adjusted, and therefore this submenu cannot be accessed.

Item	description
Saturation	Only available for video
Black&White	Only available for video create a monochrome picture (set saturation to zero)
Edges	Only available for video Edge enhancement
Contrast R	Can only be adjusted if color temperature is set to “User” Color offset for red channel
Contrast G	Can only be adjusted if color temperature is set to “User” Color offset for green channel
Contrast	Can only be adjusted if color temperature is set to “User” Color offset for blue channel

4.10 Other

This menu items gives access to the submenu of Language, OSD setup, freeze mode, runtime, keyboard options and input selections.

4.10.1 Language

Use this submenu to set the OSD language.

Item	description
German	OSD will be in German
English	OSD will be in English

4.10.2 OSD setup

Use this submenu to select the OSD settings.

Item	description
Cascade menus	Select cascaded menus
Transparency	Select transparent OSD
Default colors	Select the desired OSD color
X-Position	Horizontal placement of the OSD
Y-Position	Vertical placement of the OSD
OSD timeout	Define the time the OSD closes automatically if no key is pressed
Help	For most menu items a short explanation is available

4.10.3 Freeze mode

This menu item is a command to freeze the picture.

4.10.4 Runtime

This menu item opens a submenu where some system information is displayed. In this menu, information can only be read, not set!

Item	description
Runtime	Actual runtime of the **Multi Input Module**
Backlight	n.a.
Temperature	Actual system temperature

4.10.5 Keyboard options

If desired, the function of the keys on the IR Remote Control when the OSD is off can be adjusted.

Item	description
Up	Options for the up key.- Default: gives access to the menu Input source Disabled: no function if the OSD is closed.
Left Right	Options for the left/ right key.- Default left: gives access to the menu Info Default right: gives access to the menu Geometry Disabled: no function if the OSD is closed. Input: toggling through the inputs Contrast: adjust contrast Brightness: adjust brightness
Down	Options for the down key.- Default: toggling through the inputs Disabled: no function if the OSD is closed. Contrast: Down and M keys are used to adjust contrast value Brightness: Down and M keys are used to adjust brightness value Inverse: Change of increase and decrease function of Down and M when contrast or brightness adjust is selected.

4.10.6 Input Selection

This menu allows to activate or deactivate specific actions for the inputs

Item	description
Function	The functions provided by the keys of the IR Remote Control and the Search and Supervision activation should be applicable (or not applicable) for the inputs listed below
VGA 1	Include VGA1: Functions are applicable for the source connected to RGB
VGA 2	Refers to the analog pins of the DVI interface
DVI	Include DVI: Functions are applicable for the source connected to DVI
Video	Include Comp1: functions are applicable for the source connected to Video 1 Include Comp 2: functions are applicable for the source connected to Video 2 Include Y/C: functions are applicable for the source connected to S-Video AV: (input not available)
SDI	Include SDI: Functions are applicable for the source connected to SDI (option on request)

5 RS 232 Remote Control

The **Multi Input Module** can also be operated via RS232 Remote Control. The following chapter describes cabling, settings and protocol.

5.1 Cabling and setting

The RS232 communication offers an additional way to adjust and control the OSD settings. Therefore a simple RS232 protocol is used. Each data stream has a fixed length of 10 bytes.

The remote control master (RCM) sends the command to a respective remote control slave (RCS).

To allow to connect more than one **Multi Input Module**s to the RS232 port of a master (e.g. personal computer) an RS232 „ring" technique is to use. Since RS232 is not recommended for more than two terminals each slave must repeat the incoming messages for the next client. The last slave is terminated by means of a shorting plug.

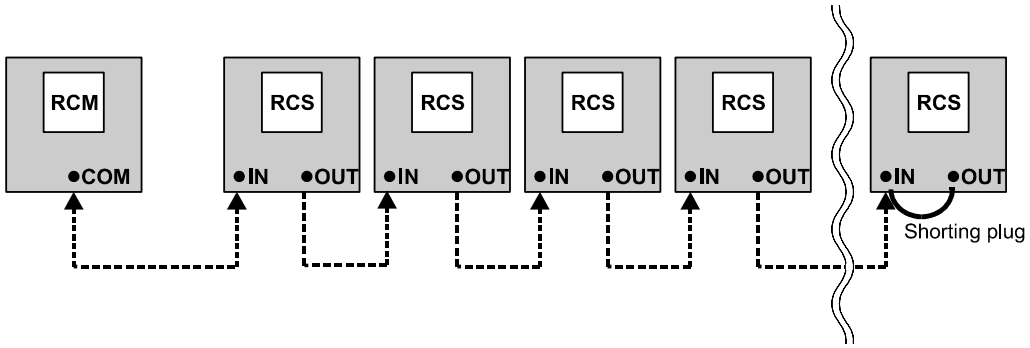


Figure 4
RS 232 cabling

The following table list the recommended setting of the communication parameters:

Parameter	value
Baud-rate	9600
Parity	Even
Data-bits	8
Stop-bits	1

If you build up a session in a ring you should perform a "PING" command at first, to ensure that all Multi Input Modules have a unique number.

5.2 Structure of Messages

A standard read/write message has the following structure:

<Start Bytes> <Multi Input Module Address> <Command Bytes> <Value> <Checksum Byte> <Stop Bytes>

Communication lost or timeout has the following structure:

<Start Bytes> <Multi Input Module Address> <0xAAAA> <0x5555> <0xAA> <0x0055>

These are the elements of a message in detail:

<Start Bytes>	The "start bytes" **0x55AA** informs the **RCS** (in case of transmission) or the **RCM** (in case of reception) that a new data transfer will take place.
<Multi Input Module Address>	The "address" defines the address of the **Multi Input Module** (0x01...0xFF) the computer wants to talk to (in case of (transmission) or the address of the **Multi Input Module** that answers (in case of reception). The maximum number of **Multi Input Module**s that can be addressed by one computer is 256.
<Command Bytes>	The two command bytes comprises the command itself (cf. General commands) (bit15...12) and the item to read or to write or the keycode, respectively (cf. Key Codes)
<Value Bytes>	The range comprises 0x0000 to 0xFFFF. This byte defines the value to be read/set. In case a feature will be enabled/disabled, **0x0000** represents disabled, **0x0001....0xFFFF** represents enabled.
<Checksum Byte>	The checksum is evaluated by the recipient and used to detect errors during transmissin or reception. See the section below for a detailed explanation on calculating the checksum.
<Stop Bytes>	The "stop bytes" **0x00FF** informs the RCS (in case of transmission) that the data transfer is complete and that the interpretation of the command and data bytes can start. The "stop bytes" **0x00FE** is the ACK stop condition from the RCS to the RCM (ACK). In case communication was lost or a timeout has occurred, NACK stop condition from client is sent: **0x0055** If the recipient does not exist, the command comes back to the **RCM** with the unchanged "stop bytse" **0x00FF.**

5.2.1 Checksum Byte

The checksum byte is the generated by adding the following bytes:

<Multi Input Module Address> + LoByte(<Command Bytes>) + HiByte(<Command Bytes>)+LoByte(<Value Bytes>) + HiByte(<Value Bytes>) AND 0xFF

(AND 0xFF: After summing up, MOD 256 has to be applied to the sum)

5.2.2 General commands

code	description
0x0	Read menu item, from RCS (see also CMD 0x4)
0x1	Write menu item, to RCS (see also CMD 0x4)
0x2	key, simulate keystroke on RCS
0x3	repeated key, simulate repeated keystroke on RCS (steps will be greater)
0x4	Save, necessary if items adjusted over CMD 0x0 and 0x1
0x5	ping, automatically numbering all RCS in the RS232 ring (in physical order)
0x6	File system Command
0x7	Firmware Update
0x8	RAM Read (simplified Read Current 0x6007 command)
0x9	RAM Write (simplified Write Current 0x6008 command).
0xA	NACK (read only)

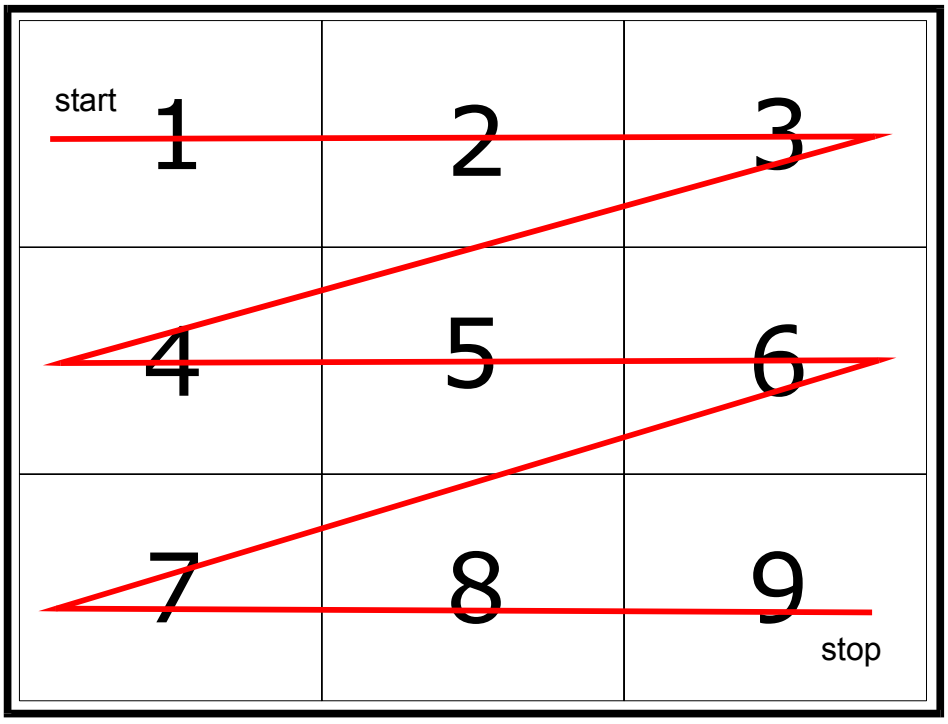
5.2.3 Key Codes

code	description
0x0B6	Left key
0x08B	Up key
0x0B7	Right key
0x08D	Down key
0x08C	OK key

5.2.4 Monitor wall

Code	Item	value
0x3xxx	0: monitor number is not changed 1...1024: Monitor is the # within the monitor wall 1025 (0x401): Numbering is done automatically within the wall	Bit(5..0): number of monitors in X direction Bit(7..6): not used Bit(13..8): numbers of monitors in Y direction Bit 14: force black (0: normal, 1: black) Bit 15: monitor wall on/off (1: on, 0: off)

Automatic numbering is done in the sequence of the remote control cabling. In order to avoid confusion and to make use of the automatic numbering, cabling has to be done always from left to right, starting with the top most row (seen from front). This implies that the cable connecting the last Multi Input Module of the previous row to the first Multi Input Module of the following row runs diagonally.



5.2.5 Commands corresponding to the OSD menu Input Signal

itemno	menu	item	description
38Dh	Input Signal	VGA 1	Show {1st PC} input signal.
49Ah	Input Signal	VGA 2	Show {2nd PC} input signal.
4B9h	Input Signal | Video	COMP 1	Show {1st composite} input signal.
4BAh		COMP 2	Show {2nd composite} input signal.
4BBh		Y/C	Show {Y/C} input signal.
4BCh		AV	Show {AV} input signal.
73Ah	Input Signal	DVI	Show {DVI} input signal.
4A0h	Input Signal	SDI	Show {SDI} input signal.
4B0h	Input Signal | Video options	Source	Optimize color recovery for {VCR}, {satellite}- or {terrestrial} television.
4A7h		Auto Norm	Detection of the Videostandards {PAL}, {NTSC} and {SECAM}.
3CDh		Norm	Selection of the desired videostandards.
5D7h		Auto Format	Detection of {16:9} or {Letterbox formats}.
4A8h		AV	{Standard} shows the {composite} signal of the {AV} input. {RGB & YUV} shows the {component} signals of the {AV} input.
4AAh	Input Signal | VGA options	Auto Sync Detect	Enables auto detection of the supplied synchronization signal. Supported: {Separate HV-Sync}, {C-Sync} or {Sync on Green}.
4ABh		HV Sync	
4ACh		Composite Sync	
4ADh		Sync on Green	
4AEh		Auto Black&White	Detection of monochrome pictures supplied on the {green} channel.
5B7h		H-Clamp	Horizontal Clamp Place. Only for special purposes. Default value is 8. {Attention: Wrong settings may cause color artifacts}
4B4h	Input Signal | SDI options	Format	
4B5h		SMPTE	
4B6h		NRZI	
4B7h		DESC	
4BEh	Input Signal | Signal management	Power On	Which input will be select at power on. {Last} means the last active input will be select again.
4BFh		Search	Allow search of active inputs at {No signal}.
4C0h		Supervision	Enables auto selection of other inputs if new signals are detected. {Remark:} Supervision of inactive inputs is only possible for inputs which are not in the same group as the active input.

5.2.6 Commands corresponding to the OSD menu Geometry (VGA)

itemno	menu	item	description
399h	Geometry | Input	Pixel rate	Adjust pixel rate until the whole frame appears the same. {Hint}: Use Windows Shut Down Picture for adjustment.
39Eh		Phase shift (for VGA 1)	Adjust phase shift to get best picture quality.
5B6h		Phase shift (for VGA 2)	Adjust phase shift to get best picture quality.
39Ch		X-Position	Horizontal frame offset.
39Dh		Y-Position	Vertical frame offset
39Ah		Pixel	Number of pixel of the incoming PC signal. For e.g. SXGA: 1280.
39Bh		Lines	Number of lines of the incoming PC signal. For e.g. SXGA: 1024. {I} or {i} indicates {interlaced} signals.
433h	.Geometry | Input |Interlaced	Non-Interlaced	
437h		PC	Optimized picture for {PC} signals.
438h		Sport	Optimized picture for fast moving {video} frames.
439h		Movie	Optimized picture for less moving {video} frames.
4B1h		SoG Level	Comparator voltage for the sync on green slicer.
39Fh	Geometry | Input	Auto	Selfadjustment of the {geometry parameter}, {phaseshift} and {contrast}. Color values will be set to their default values.
3A1h	Geometry | Display	Pixel	Number of active display pixel per line.
3A2h		Lines	Number of active display lines.
3A3h		X-Offset	Output: if active display area is chosen smaller than its real resolution, the horizontal position can be adjusted.
3A4h		Y-Offset	Output: if active display area is chosen smaller than its real resolution, the vertical position can be adjusted.
3A5h		Mirror	Enable mirrored display. {Note:} Not available for all input resolutions.
3A6h	Geometry | Advanced |	Standard	In every case the input signal will be displayed on the whole display.
3A7h		Original	The Input Frame will be displayed 1:1.
3BCh	Geometry | Advanced |Original	X-Position	Horizontal position for scanning the input frame.
3BDh		Y-Position	Vertical position for scanning the input frame.
3A8h		Zoom	Magnification of the input frame.
3C0h	Geometry | Advanced |Zoom	X-Factor	Horizontal magnification factor.
3C1h		Y-Factor	Vertical magnification factor.
3BEh		X-Position	Horizontal position for the magnified input frame.
3BFh		Y-Position	Vertical position for the magnified input frame.
ACCh	Geometry | Wall	Display wall	Enable or disable the display wall function
AC7h		Display no	Position of the current display within the display wall. Counts up from left to right, from top to bottom.
AC8h		Displays horizontal	Number of displays in horizontal direction
AC9h		Displays vertical	Numbe of displays in vertical direction
ACAh		Border horizontal	Border of one display in percent of the active width
ACBh		Border vertical	Border of one display in percent of the active height

5.2.7 Commands corresponding to the OSD menu Geometry (Video)

itemno	menu	item	description
3D6h	Geometry	Default	
3D7h		Zoom 1	
3D8h		Zoom 2	
3DBh		Settings	define your own frame format. {Only for special purposes.}
3E1h	Geometry | Input	Pixel	
3E2h		Lines	
3E3h		X-Position	
3E4h		Y-Position	
3E5h	Geometry | Display	Pixel	
3E6h		Lines	
3E7h		X-Position	
3E8h		Y-Position	
3EAh	.Geometry | Format	Parameter 1	Format correction achieved by adding black lines or columns.
3EBh		Parameter 2	Format correction achieved by cropping lines or columns.
3ECh		Parameter 3	Format correction achieved by panorama or waterglass view.
3F5h	Geometry | Zoom	Zoom	
3F1h		X-Position	
3F2h		Y-Position	
3F3h		X-Factor	
3F4h		Y-Factor	
ACCh	Geometry | Wall	Display wall	Enable or disable the display wall function
AC7h		Display no	Position of the current display within the display wall. Counts up from left to right, from top to bottom.
AC8h		Displays horizontal	Number of displays in horizontal direction
AC9h		Displays vertical	Numbe of displays in vertical direction
ACAh		Border horizontal	Border of one display in percent of the active width
ACBh		Border vertical	Border of one display in percent of the active height
3DCh	Geometry	Mirror	Enable mirrored display. {Note:} Not available for all input resolutions.
3D9h		Sports	Optimized picture for fast moving frames.
3DAh		Movie	Optimized picture for less moving frames.

5.2.8 Commands corresponding to the OSD menu Picture

itemno	Menu	Item	description
3A9h	Picture	Brightness	
3AAh		Contrast	
3ABh		Gamma	Compensation of the color difference from TFT to CRT displays. {Remark:} the default value is about 8.
5A0h		Color temperature	0->User 1->3200 2->5500 3->6500 4->9300 5->7100
3ACh		Sharpness	
4C3h	...->Colors	Saturation	
5F0h		Red	
5F1h		Green	
5F2h		Blue	
4AFh		Black&White	Generates monochrome Pictures. If {VGA} is active only the {green} color signal is processed.
4C4h		Edges	
3B4h	Picture	Backlight	Adjust backlight brightness

5.2.9 Commands corresponding to the OSD menu Other

itemno	menu	item	description
3C8h	Other | Language	Deutsch	
3C9h		English	
3FBh	Other | OSD Setup	Cascade Menus	
3FEh		Transparency	
3FFh		Default-colors	
3FCh		X-Position	
3FDh		Y-Position	
3C4h	Other	Freeze mode	{Remark:} Adjustments in geometry or picture parameter will clear freeze mode.
3C5h		Help	Use{ up}, {down} to select a menu item. Use {left}, {right} to change the value or to reach the next submenu. Use {ok} to go back to the previous menu or to close the OSD.
3C7h	Other		
461h	Other | Keyboard options | Left Right	Default	Opens the {INFO} or {GEOMETRY} OSD-menus.
462h		Functionlist I	Select 1st function list. {Attention:} Be sure that there is always one key left which can open the OSD-menu.
463h		Disabled	The {Left} and {Right} keys are only available while OSD-menu is open. {Attention:} Be sure that there is always one key left which can open the OSD-menu.
464h		Inputs	Toggles between the inputs.
47Dh	Other | Keyboard options | Left Right | Inputs	VGA 1	
47Ch		VGA 2	
47Eh		COMP1	
47Fh		COMP2	
480h		Y/C	
5AFh		AV	
5B0h		SDI	
465h	Other | Keyboard options | Left Right	Contrast	
466h		Brightness	
467h	Other | Keyboard options | Up	Default	Opens the {INPUT} OSD-menus.
468h		Functionlist II	Select 2nd function list. {Attention:} Be sure that there is always one key left which can open the OSD-menu.
469h		Disabled	The {Up} key is only available while OSD-menu is open. {Attention:} Be sure that there is always one key left which can open the OSD-menu.
46Ah	...->Functionlist I	Create	After activating this item the menu can used as usual. With the {left} key the actual selected item is added to the function list. Closing the OSD-menu will stop this function.
46Bh		Delete	Deletes all items in the function list.
46Ch	..->Functionlist II	Create	After activating this item the menu can used as usual. With the {left} key the actual selected item is added to the function list. Closing the OSD-menu will stop this function.
46Dh		Delete	Deletes all items in the function list.
476h	Other | Keyboard options | Down	Default	Toggles between the inputs.

470h	Other | Input Selection| Configuration | Function	VGA 1	Include VGA 1
474h		VGA 2	Include VGA 2
471h		COMP 1	Include COMP 1
472h		COMP2	Include COMP 1
473h		Y/C	Include Y/C
5ADh		AV	Include AV
5AEh		SDI	Include SDI
477h	Other | Keyboard options | Down	Functionlist I	Select 1st function list. {Attention:} Be sure that there is always one key left which can open the OSD-menu.
478h		Disabled	The {Down} key is only available while OSD-menu is open. {Attention:} Be sure that there is always one key left which can open the OSD-menu.
479h		Contrast	{Down} and {Ok} keys are used to adjust contrast value.
47Ah		Brightness	{Down} and {Ok} keys are used to adjust brightness value.
47Bh		Inverse	Direction of {Down} and {Ok} is inverted.

5.2.10 Protocol examples

Low Bytes (LSB) must be transmitted / received first!

5.2.10.1 Example: Set Item 3 of **`Multi Input Module`** 1 to a value of 0xFF.

<Start Bytes>	<Address>	<Command Bytes>	<Value Bytes>	<Checksum Byte>	<Stop Bytes>
0x55AA	0x01	0x1003	0xFF	0x13	0x00FF

This command is sent by the Host to the **`Multi Input Module`** with the Address 1. Written in a command line (and taking into consideration that the low bytes have to be sent first), this reads:

0xAA 0x55 0x01 0x03 0x10 0xff 0x00 0x13 0xFF 0x00

The **`Multi Input Module`** with the address 1 returns

<Start Bytes>	<Address>	<Command Bytes>	<Value Bytes>	<Checksum Byte>	<Stop Bytes>
0x55AA	0x01	0x1003	0xFF	0x13	0x00FE

Command line: 0xAA 0x55 0x01 0x03 0x10 0xff 0x00 0x13 0xFE 0x00

5.2.10.2 Example: Read value of Item 4 of **Multi Input Module** 2.

<Start Bytes>	<Address>	<Command Bytes>	<Value Bytes>	<Checksum Byte>	<Stop Bytes>
0x55AA	0x02	0x0004	0x00	0x06	0x00FF

At read commands value should always be zero. (0x0000)

The **Multi Input Module** with the address 2 returns

<Start Bytes>	<Address>	<Command Bytes>	<Value Bytes>	<Checksum Byte>	<Stop Bytes>
0x55AA	0x02	0x0004	0x0500	0x0B	0x00FE

5.2.10.3 Example: Simulate pressing the M key on the IR Remote Control at the **Multi Input Module** with the address 1

<Start Bytes>	<Address>	<Command Bytes>	<Value Bytes>	<Checksum Byte>	<Stop Bytes>
0x55AA	0x01	0x208C	0x0000	0xAD	0x00FF

The **Multi Input Module** with the address 1 returns (if the key has no effect to any value):

<Start Bytes>	<Address>	<Command Bytes>	<Value Bytes>	<Checksum Byte>	<Stop Bytes>
0x55AA	0x01	0x208C	0x0000	0xAD	0x00FE

The **Multi Input Module** with the address 1 returns the new value (if the key has effected a value):

<Start Bytes>	<Address>	<Command Bytes>	<Value Bytes>	<Checksum Byte>	<Stop Bytes>
0x55AA	0x01	0x208C	0x0500	0xB2	0x00FE

5.2.10.4 Example: Ping

Pinging allows numbering and counting of all **Multi Input Module**s available in the RS232 Ring. Since pinging is a broadcast command sent to all RCS, the address is 0x00

<Start Byte>	<Address>	<Command Bytes>	<Value Bytes>	<Checksum Byte>	<Stop Byte>
0x55AA	0x00	0x5000	0x5500	0xA5	0x00FF

Note: At pinging <Address> has no affect, <Data Bytes> must be set to 0x5500.

Broadcast functionality is only available for the pinging command!

The **Multi Input Module** with the address 1 returns

<Start Bytes>	<Address>	<Command Bytes>	<Value Bytes>	<Checksum Byte>	<Stop Bytes>
0x55AA	0x00	0x5000	0x5501	0xA6	0x00FE

Low byte of value returns the (new) number of the Multi Input Modules in the RS232 Ring

The **Multi Input Module** with the address 2 returns

<Start Bytes>	<Address>	<Command Bytes>	<Value Bytes>	<Checksum Byte>	<Stop Bytes>
0x55AA	0x00	0x5000	0x5502	0xA7	0x00FE

6 Input Selection tool

The Multi Input Module comes with the Input Selection Tool to enable switching of the inputs via a graphical user interface.

6.1 Requirements

- Windows 2000 Service Pack 4 or later

or

- Windows XP Professional Service Pack 1 or later

These requirements are checked before installation A prompt is displayed to install any additionally required software, if necessary. The installation then has to be restarted.

You need administrative privileges to install the software. If the computer reboots during installation, users have to log in with administrative privileges after the reboot as well.

6.2 Setup

You need administrative privileges to install the software.

Place the CD into the CD drive and run **setup.exe**. The wizard will guide you through the installation process. Follow the displayed instructions.

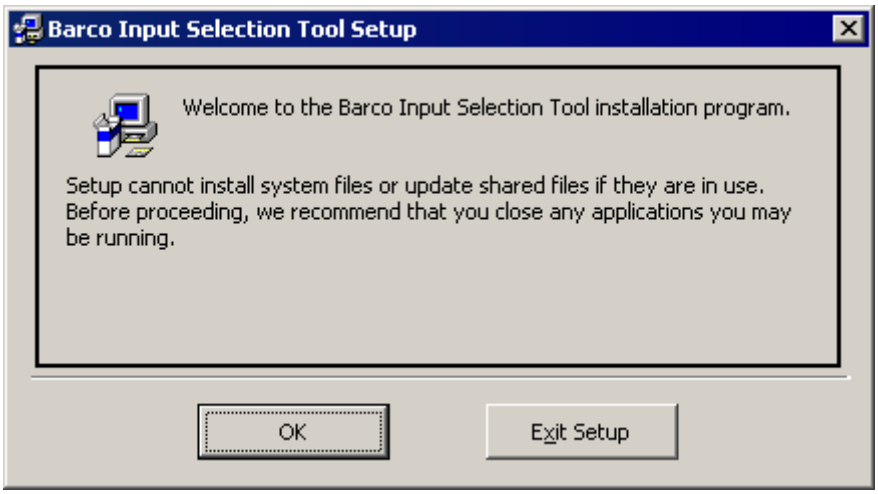

Barco Input Selection Tool Setup
Welcome to the Barco Input Selection Tool installation program.
Setup cannot install system files or update shared files if they are in use. Before proceeding, we recommend that you close any applications you may be running.
OK
Exit Setup

Figure 5
Input Selection Tool Setup

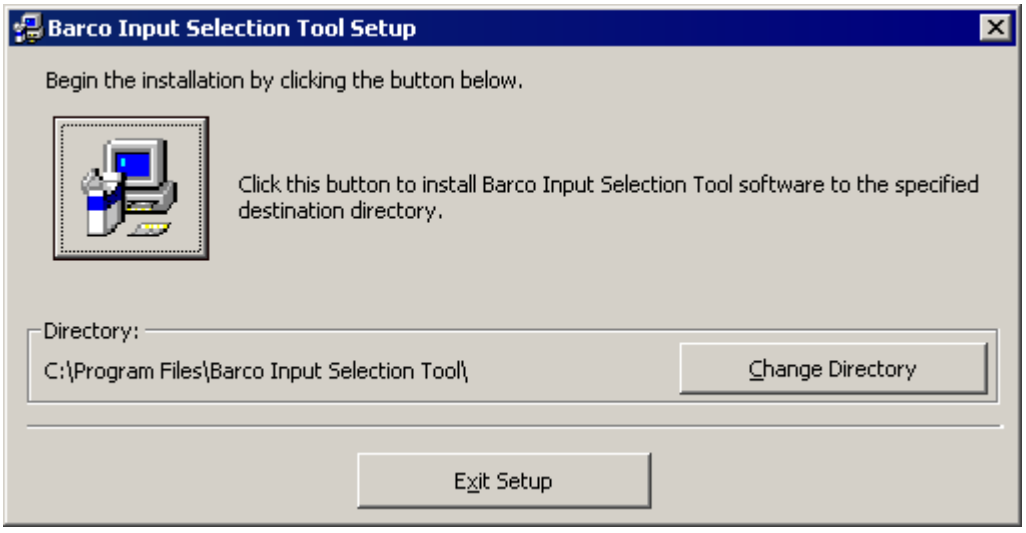

Barco Input Selection Tool Setup
Begin the installation by clicking the button below.
Click this button to install Barco Input Selection Tool software to the specified destination directory.
Directory:
C:\Program Files\Barco Input Selection Tool\
Change Directory
Exit Setup

Figure 6
Input Selection Tool Setup

The wizard copies all required files into the indicated directory.

There is no need to re-boot the system after the successful installation.

6.3 Launching the Input Selection Tool

To launch the Input Selection Tool, select
Start | Programs | Barco Input Selection Tool for OverView D Multi Input Module | Input Selection Tool.

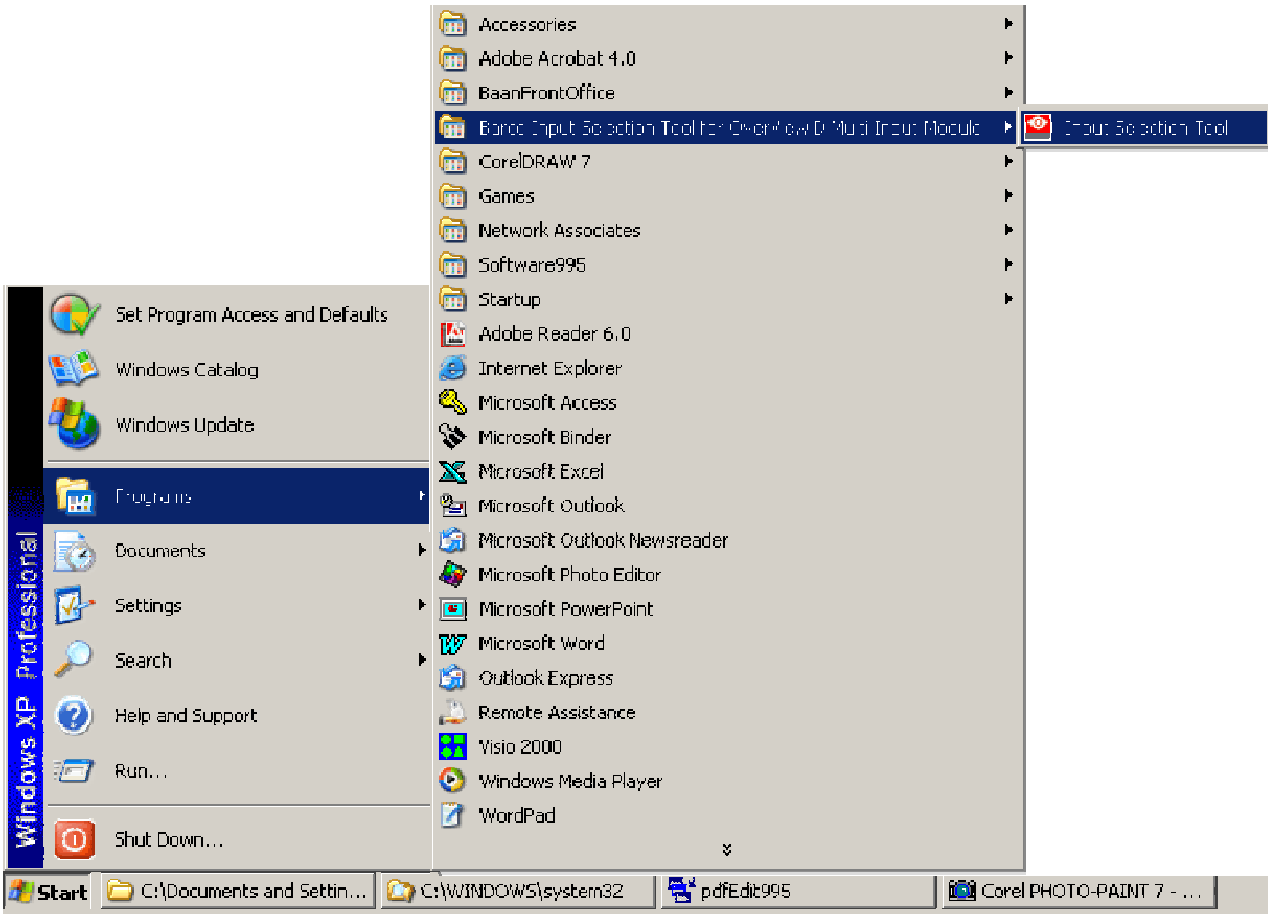


Figure 7
Launching the application

The application window of the Input Selection Tool is displayed.

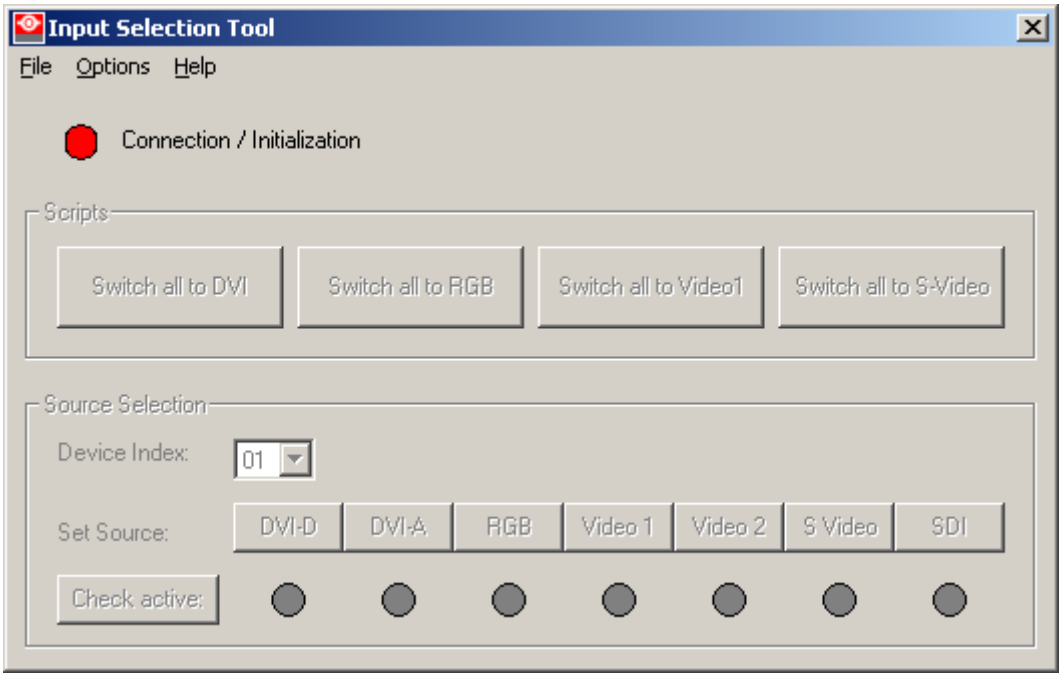


Figure 8
Input Selection Tool: application window

6.4 Menu bar of the Input Selection Tool

The Input Selection Tool has a menu bar with the menus **File**, **Options**, and **Help**.

6.4.1 File menu

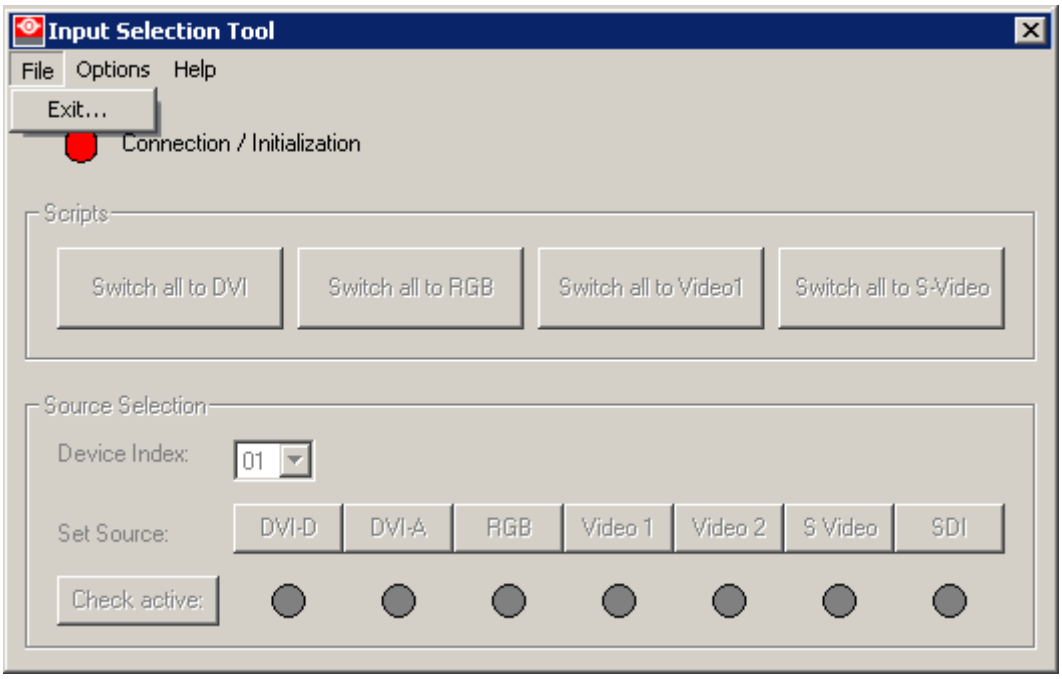


Figure 9
Input Selection Tool: File menu

The **File** menu includes the command **Exit** to shut down the application. The Input Selection Tool can also be closed by clicking on the Close icon on the window caption.

If the application is closed while a connection is established, the connection will be closed first!

6.4.2 Options menu

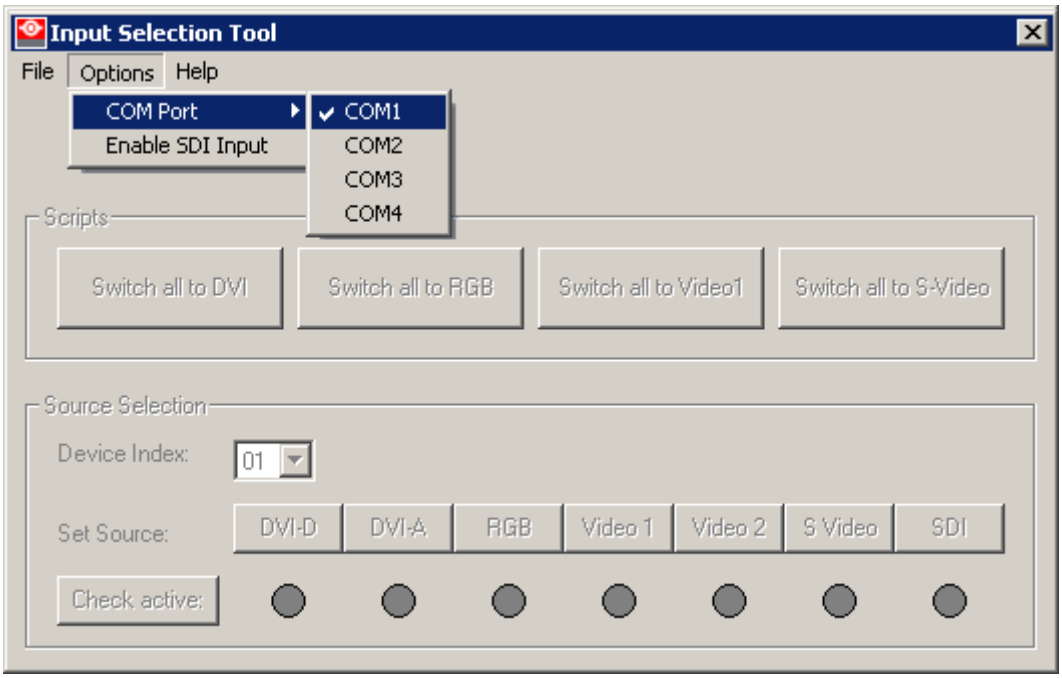


Figure 10
Input Selection Tool: Options menu

The **Options** menu allows to select the respective COM port. As default COM1 is selected. In case the remote control cable is connected to a different COM port, please adjust the selection!

All other setting of the remote control communication are fixed according the parameter values mentioned in Cabling and setting.

On special request, the Multi Input Module can also be equipped with an **SDI** input. In case an SDI input is available, it has to be enabled by selecting **Enable SDI input**. This command then will activate the SDI button in the **Source Selection** section below.

6.4.3 Help

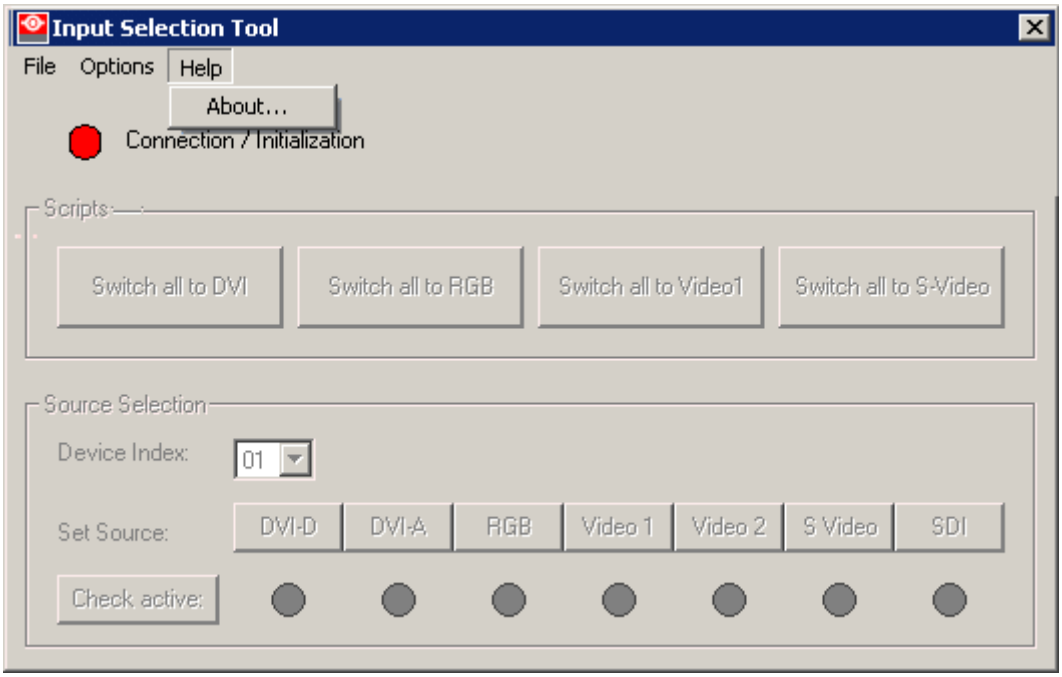


Figure 11
Input Selection Tool: Help menu

The Help menu has the menu entry **About** which informs about the software version:

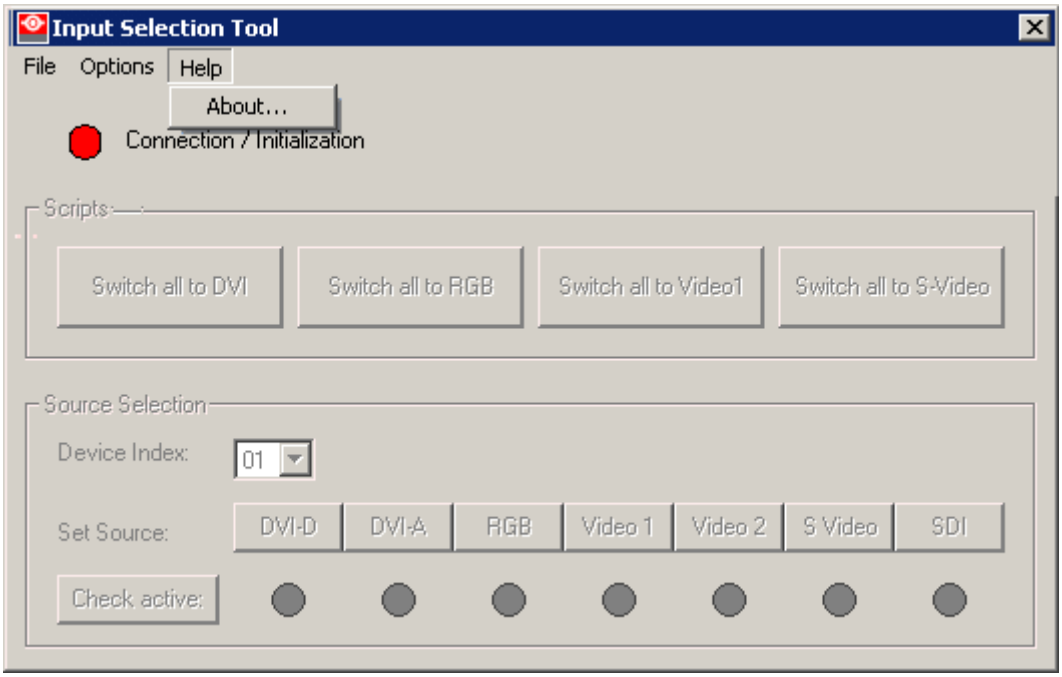


Figure 12
Input Selection Tool: Help menu, About

6.5 Establishing a connection

Beneath the menu bar, a connection icon indiciates whether the remote control connection has been established (green icon) or not (red icon). This icon is also a toggle button: clicking on the red icon will establish the remote control connection (the icon will turn green) and vice versa.

Clicking on the red icon will establish the connection.

As soon as the connection is established, the selection of the COM port in the **Options** menu is disabled: With an existing connection, changing the COM port is not allowed.

6.6 Operating the Multi Input Module by means of the Input Selection Tool

Establish the connection for operating the Multi Input Module.

The command buttons of the Input Selection Tools window get enabled. There are two kind of command buttons: command buttons which trigger a fixed action are placed in the section **Source Selection**. Command buttons which can be customized are placed in the **Script** section.

6.6.1 Script section

The **Script** Section provides the convenient possibility to start 4 different scripts assigned to the buttons. The actions launched by these scripts as well as the caption of the button can be individually programmed according the actual requirements.

By means of a script, e.g. all inputs can be switched at once.

Customization of the buttons and the sample scripts are explained later, cf. Customization

6.6.2 Source Selection section

The **Source Selection** section allows to switch one Multi Input Module to one of the inputs DVI, RGB, Video1, Video2, S-Video, (and SDI, SDI is only available on special request only, therefore the button is grayed out).

To address a specific device, you have to select the respective **Device Index**. The **Device Index** is the Remote Control address as assigned according the cabling: the first device in the remote control chain has the address 1, the second device has the address 2 and so on, cf. Cabling and setting

Select the desired device by means of the **Device Index** listbox.

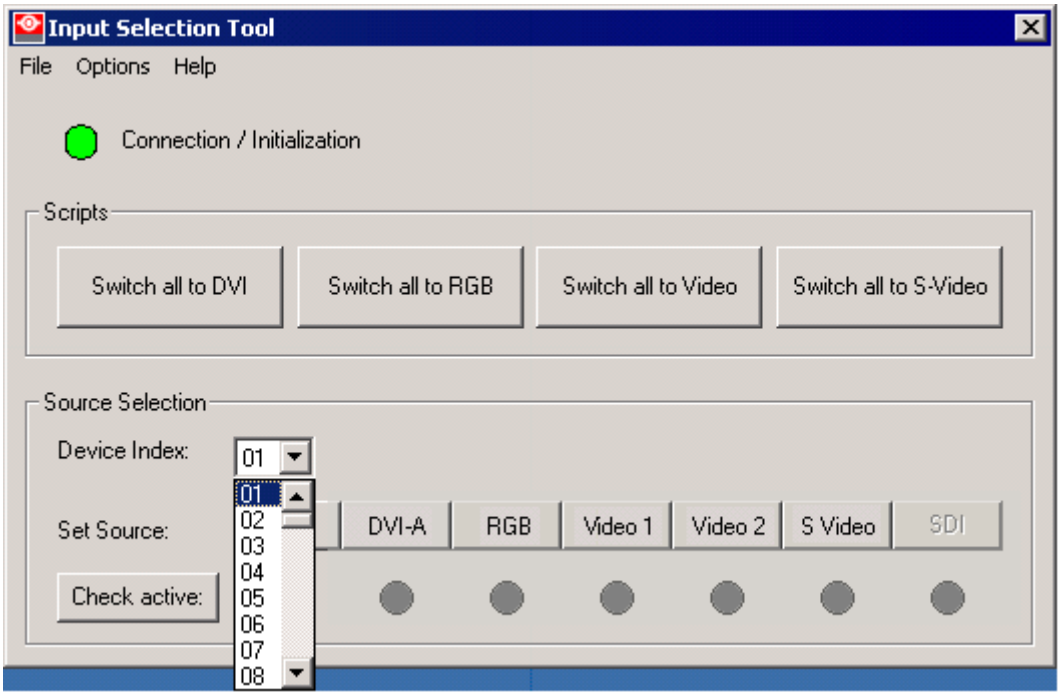


Figure 13
Input Selection Tool: Selecting a device

When the device is selected, you can switch its input by means of the respective button. Click on **DVI** to select the DVI input.

Besides the buttons to switch the inputs, an additional button with the caption **Check active** is placed on this section. Click this button to get the information of the actual active input of the selected device.

In case the signal of the selected input is lost, the Multi Input Module automatically switches to another input which provides a signal. To check if the system still works with the original set input, click on the Check active button.

Beneath each button, there is a "check mark" which indicates the result of clicking the **Check active** button. Usually the buttons are grayed out. When activating the **Check active** button, they show the status of the inputs: a red icon stands for inactive, and the green icon represents the active input. This indication is visible for a some seconds.

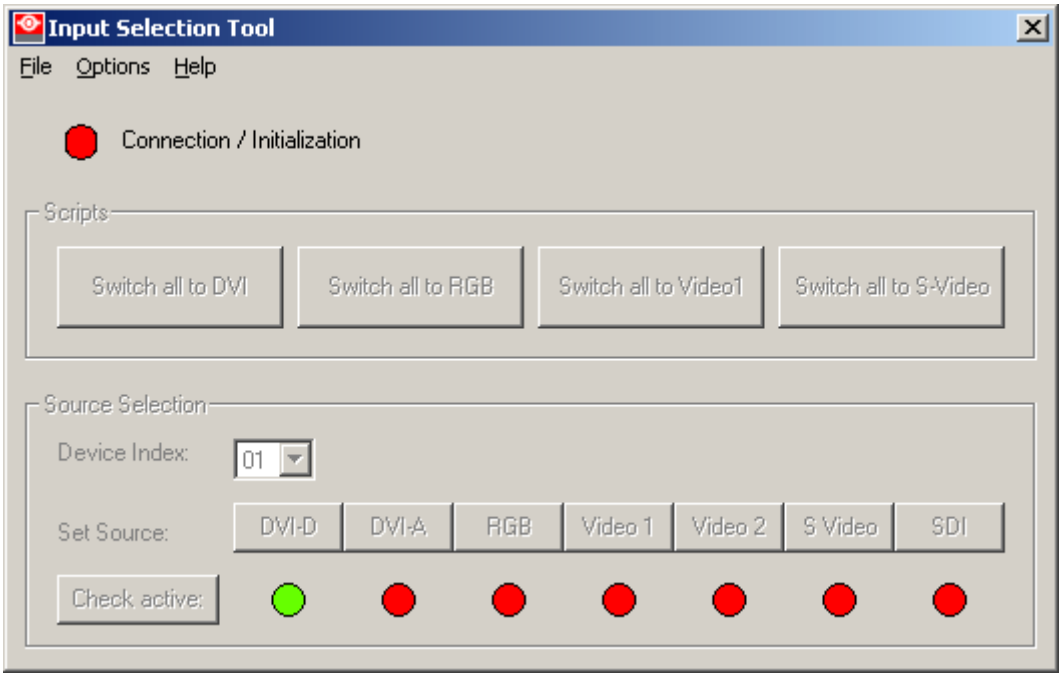


Figure 14
Input Selection Tool: Check active button has been pressed, DVI input is active

6.6.3 Customization

As mentioned above, the buttons on the script sections can be assigned to individually programmed actions. Basically all commands listed in the chapter Remote Control commands (cf. Structure of Messages can be included in a script.

6.6.3.1 Location and naming of the script files

The script files have to be stored in the installation directory of the Input Selection Tool.

A script assigned to the first button has to be saved as **ISTScript1.txt**.

A script assigned to the second button has to be saved as **ISTScript2.txt**, and so on.

The sript executed when establishing the connection has to be saved as **ISTScriptInit.txt**.

The names of the files are not case sensitive!

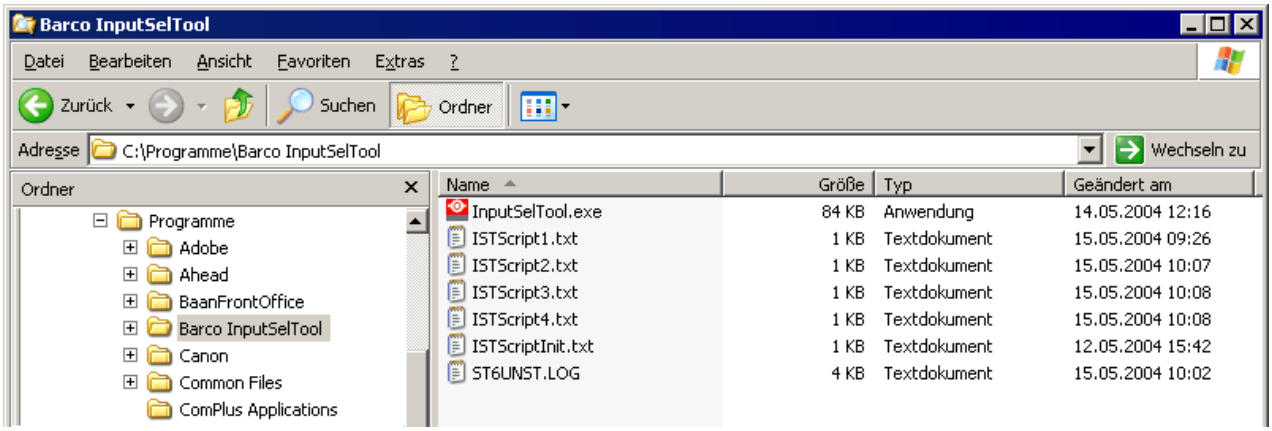


Figure 15
Location of script files

6.6.3.2 Syntax of the script files

The following lines are an extract of a script file:

ISTscript1.txt

Filename, script is assigned to the first button

```
<Switch all to DVI>
```

The caption of the button is written in angular brackets

```
// All numbers including target device address must be given in hex
// Read register:  0x0???, write register: 0x1???
// Boolean values: 0x0000 means FALSE, any other value means TRUE.
```

Comments start with two slashes:

```
:01 0x173A 0x0001
:02 0x173A 0x0001
:03 0x173A 0x0001
:04 0x173A 0x0001
:05 0x173A 0x0001
:06 0x173A 0x0001
:07 0x173A 0x0001
:08 0x173A 0x0001
:09 0x173A 0x0001
:0A 0x173A 0x0001
:0B 0x173A 0x0001
:0C 0x173A 0x0001
:0D 0x173A 0x0001
:0E 0x173A 0x0001
:0F 0x173A 0x0001
:10 0x173A 0x0001
```

The command line has to start with a colon

The device to which the command is sent is addressed by means of its (hexadecimal) address.

To send a command, it has to be written in the respective register as true

:01 0x173A 0x001 therefore means:

device number 0 (01) switched (write register: 0x1) to DVI (73A) is true (0x001)

Please keep in mind to write the device address in hexadecimal.

To learn about the available commands, cf. Structure of Messages

Keep in mind that scripts are only read when the application is launched! When changing skripts, exit and restart the program!

6.6.4 Un-installation of the Input Selection Tool

To un-install, select **Start | Settings | Control Panel | Add or Remove Programs | Barco Input Selection Tool**

Click on the **Remove** button to remove the software and all of its components.

Modified scripts have to be manually deleted and – in consequence, since these files are located in this folder – also the installation directory.

7 Technical Data

This chapter provides technical data of the **Multi Input Module**

7.1 General data

B×T×H	205mm × 225mm × 85mm
weight	2kg
Power consumption	20W

7.2 Interfaces

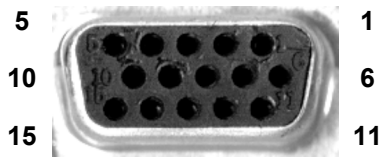
7.2.1 Video1, Video 2

Type	cinch 1.0Vpp ± 3 dB
Pin 1	Comp: Composite video input
Pin 2	GND: Ground

7.2.2 S-Video

Type	4 pin S-Video, mini Din
Pin 1	GND: Ground
Pin 2	GND: Ground
Pin 3	Y: Luminance
Pin 4	C Chrominance

7.2.3 RGB

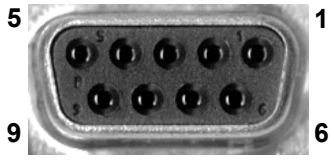


1	Red	**6**	GND red	**11**	
2	Green	**7**	GND green	**12**	
3	Blue	**8**	GND blue	**13**	HSYNC
4		**9**		**14**	VSYNC
5		**10**	GND sync	**15**	

7.2.4 DVI

Pin	Signal Assignment	Pin	Signal Assignment
1	TMDS Data 2-	**13**	-
2	TMDS Data 2+	**14**	-
3	TMDS Data 2 Shield	**15**	Ground (+5, Analog /V Sync)
4	-	**16**	-
5	-	**17**	TMDS Data 0-
6	DDC Clock	**18**	TMDS Data 0+
7	DDC Data	**19**	TMDS Data 0 Shield
8	-	**20**	-
9	TMDS Data 1-	**21**	-
10	TMDS Data 1+	**22**	TMDS Clock Shield
11	TMDS Data 1 Shield	**23**	TMDS Clock +
12	-	**24**	TMDS Clock -

7.2.5 RS232 Remote Control



		Description
Pin	Symbol	D-Sub 9 (female)
1	Loop1	1, DCD
2	Loop1	6, DTR
3	TXD	2, transmit line
4	Loop2	7, CTS
5	RXD	3, receive line
6	Loop2	8, RTS
7	Loop1	4, DSR
8	GND	9, ground
9	GND	5, ground
10	Boot	open

The pin out of the SV6 is prepared for operation as DCE (Data Carrier Equipment). Connect D-Sub 9 (female, crimpable) with a ribbon cable to SV. Leave pin 10 open.

All necessary Null-modem loops (loop1 and loop2) are provided.

Connect the RS232 interface with a standard 1:1 cable to the PC interface.

7.3 Part numbers

Article number	Description
R9852430	Option: Multi Input Module OV-D, XGA
R9852431	Multi Input Module OV-D, XGA, incl. cabling, CD-ROM, manual etc.
R9852440	Option: Multi Input Module OV-D, SXGA
R9852441	Multi Input Module OV-D, SXGA, incl. cabling, CD-ROM, manual etc.
R9842610	Option: Multi Input Module OV-D, SXGA+
R9842620	Multi Input Module OV-D, SXGA+, incl. cabling, CD-ROM, manual etc.
R9852450	Option: Multi Input Module OV-D, XGA, SDI option
R9852451	Multi Input Module OV-D, XGA, SDI option, incl. cabling, CD-ROM, manual etc.
R9852460	Option: Multi Input Module OV-D, SXGA, SDI option
R9852461	Multi Input Module OV-D, SXGA, SDI option, incl. cabling, CD-ROM, manual etc.
R9842630	Option: Multi Input Module OV-D, SXGA+, SDI option
R9842640	Multi Input Module OV-D, SXGA+, SDI option, incl. cabling, CD-ROM, manual etc.
R32914000	Input Selection Tool, CD-ROM

8 Troubleshooting

This chapter gives some hint in case the **Multi Input Module** is no longer operable and gives information how to contact the technical support of BARCO.

8.1 IR Remote Control

In case the **Multi Input Module** can no longer be operated,

- Check the distance: IR Remote Control works within 5 meters.
- Check if there are obstacles which block the IR communication.
- Exchange the batteries: Use 2x1.5 micro AA cells.

After exchanging the cells it might happen that IR Remote Control needs to be re-programmed

To program the IR remote control, press the following keys in the described sequence:

- **simultaneously press the On/Off + OK key for 3 seconds**
- **Use the numeric keys, and enter the code 2 7 0**
- **Press On/Off again.**

For confirmation, the On/Off key will blink 3 times

The “Power” key has no function in normal operation.

8.2 Hot Line

Feel free to contact us if you have any further questions!

- **BARCO N.V. Projection Systems - Europe**
  Noordlaan 5, B-8520 Kuurne
  Phone: +32-56-368-211, Fax: +32-56-368-251
  E-mail: support.bcd@barco.com, Web: www.barcocontrolrooms.com

9 Tips and Tricks

This chapter gives some hints how the functions of the Multi Input Module can be used for specific scenarios

9.1 Upscaling a source

One source can be displayed on up to 8x8 projection modules.

System requirements: The projection modules where (a part of) the source is to be displayed has to be equipped with a Multi Input Module.

Upscaling a source can easily be done via the OSD. Depending on the source, select

Geometrie|Frame Geometry|Wall (VGA)

Or

Geometrie|Settings|Wall (Video)

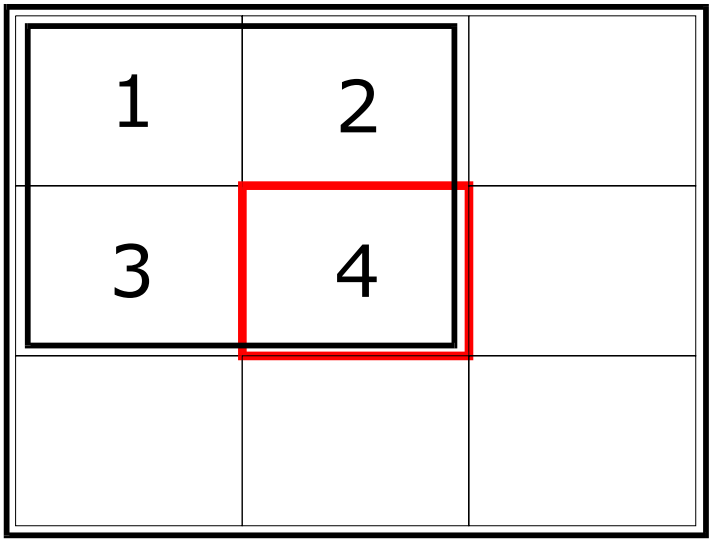
These menu entries open a sub menu with the following items:

Item	description
display wall	If this item is not checked, the following settings are NOT applied
Display no.	Number of this projection module
Display horizontal	Number of horizontal cubes of the display wall
Display vertical	Number of vertical cubes of the display wall
Border horizontal	Border of one display in percent of the active width
Border vertical	Border of one display in percent of the active height

To make use of the display wall functionality, the checkbox display wall has to be ticked!

Depending on the display size, the number of horizontal and vertical cubes has to be specified and the number of the projection module in the actual configuration.

Example: Span a video e.g. on a 2x2 sub area of a display wall

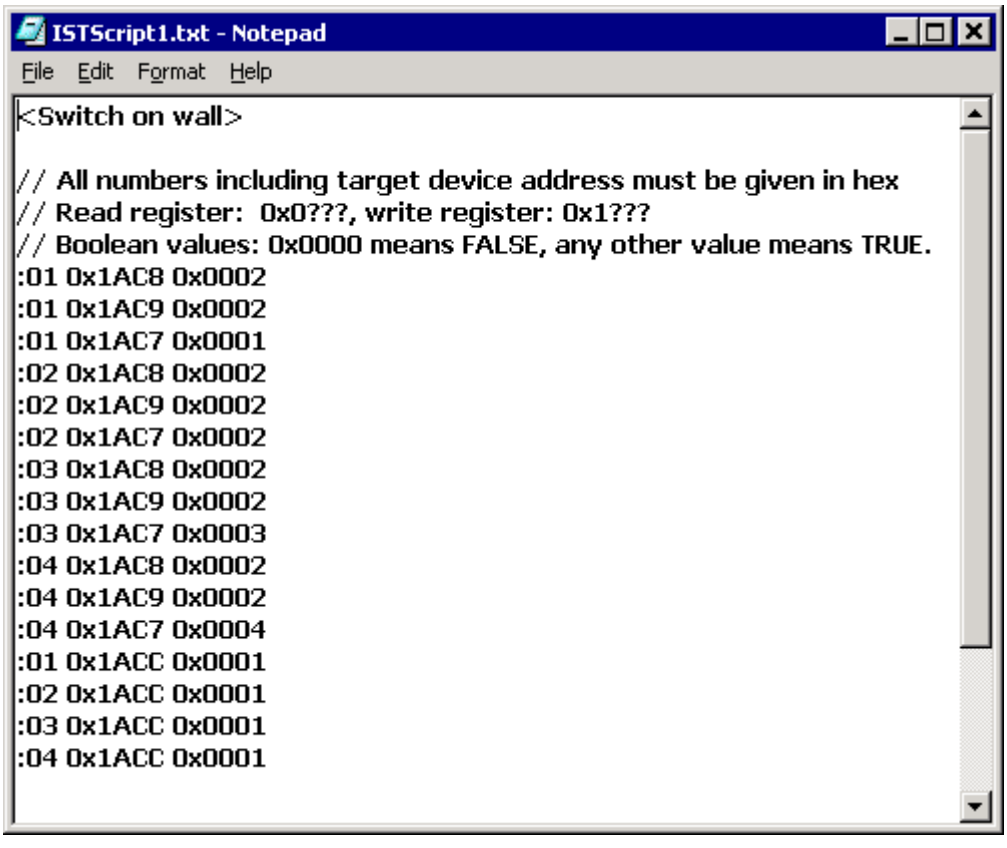


For the red-bordered projection module the following settings apply:

Item	description
display wall	checked
Display no.	4
Display horizontal	2
Display vertical	2

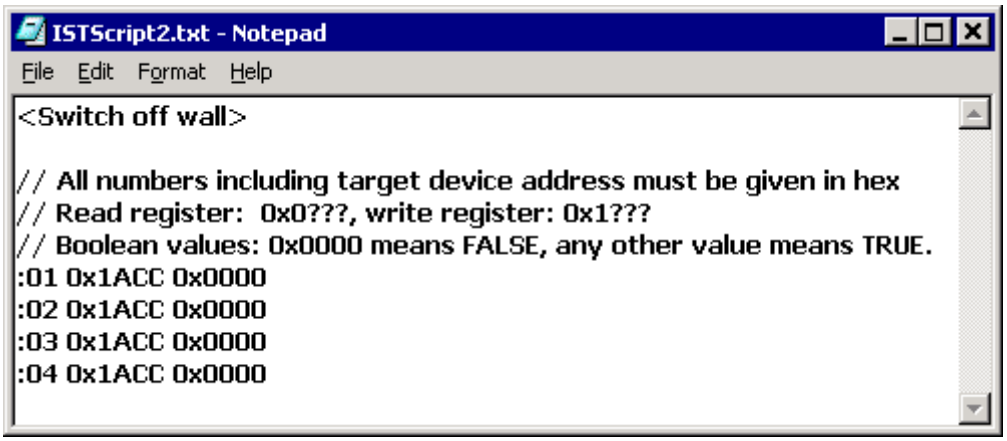
By means of a script activated via the script buttons of the InputSelectionTool, the signal can be upscaled by a simple mouse click. The following example lists the command lines:

Address	Command	Description
:01	0xAC7h 0x0001	Display no. (=1)
:01	0xAC8h 0x0002	Display horizontal (=2)
:01	0xAC9h 0x0002	Display vertical (=2)
:02	0xAC7h 0x0002	Display no. (=2)
:02	0xAC8h 0x0002	Display horizontal (=2)
:02	0xAC9h 0x0002	Display vertical (=2)
:03	0xAC7h 0x0003	Display no. (=3)
:03	0xAC8h 0x0002	Display horizontal (=2)
:03	0xAC9h 0x0002	Display vertical (=2)
:04	0xAC7h 0x0004	Display no. (=4)
:04	0xAC8h 0x0002	Display horizontal (=2)
:04	0xAC9h 0x0002	Display vertical (=2)
:01	0xACCh 0x0001	activate display wall functionality
:02	0xACCh 0x0001	activate display wall functionality
:03	0xACCh 0x0001	activate display wall functionality
:04	0xACCh 0x0001	activate display wall functionality


ISTScript1.txt - Notepad
File Edit Format Help
<Switch on wall>
// All numbers including target device address must be given in hex
// Read register: 0x0???, write register: 0x1???
// Boolean values: 0x0000 means FALSE, any other value means TRUE.
:01 0x1AC8 0x0002
:01 0x1AC9 0x0002
:01 0x1AC7 0x0001
:02 0x1AC8 0x0002
:02 0x1AC9 0x0002
:02 0x1AC7 0x0002
:03 0x1AC8 0x0002
:03 0x1AC9 0x0002
:03 0x1AC7 0x0003
:04 0x1AC8 0x0002
:04 0x1AC9 0x0002
:04 0x1AC7 0x0004
:01 0x1ACC 0x0001
:02 0x1ACC 0x0001
:03 0x1ACC 0x0001
:04 0x1ACC 0x0001

To switch back to the standard display mode, simply deactivate the display functionality (in the OSD, remove the tick in the "display wall" checkbox

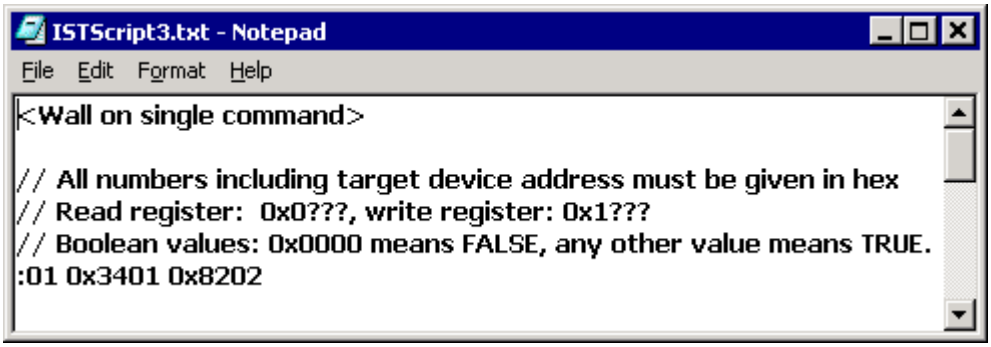
Address	Command	Description
:01	0xACCh 0x0000	deactivate display wall functionality
:02	0xACCh 0x0000	deactivate display wall functionality
:03	0xACCh 0x0000	deactivate display wall functionality
:04	0xACCh 0x0000	deactivate display wall functionality


ISTScript2.txt - Notepad
File Edit Format Help
<Switch off wall>
// All numbers including target device address must be given in hex
// Read register: 0x0???, write register: 0x1???
// Boolean values: 0x0000 means FALSE, any other value means TRUE.
:01 0x1ACC 0x0000
:02 0x1ACC 0x0000
:03 0x1ACC 0x0000
:04 0x1ACC 0x0000

In case the remote control cabling of the display wall is according the rule given in Monitor wall, the scenario described above can be achieved by a single command using the monitor wall functionality:

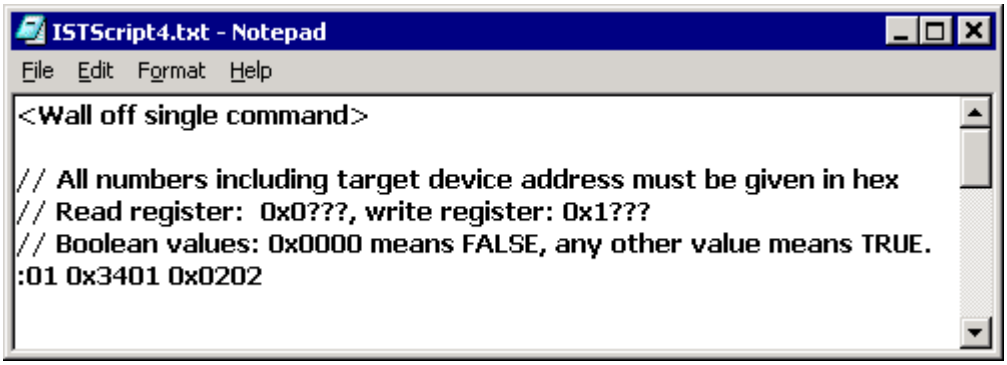
Address	Command	Description
:01	0x3401 0x8202	Assigns a remote control address according the cabling (0x3401) and informs about the number of horizontal and vertical cubes, and switches on the wall functionality (0x8202), cf. Monitor wall.

8				2				0				2			
1	0	0	0	0	0	1	0	0	0	0	0	0	0	1	0
Bit 15	Bit 14	Bit 13	Bit 12	Bit 11	Bit 10	Bit 9	Bit 8	Bit 7	Bit 6	Bit 5	Bit 4	Bit 3	Bit 2	Bit 1	Bit 0
Monitor wall on/off == on	Force Black	Number of monitors in Y direction (==2)						Not used	Not used	Number of monitors in X direction == 2					



To switch back to the standard display mode, simply deactivate the display functionality

Address	Command	Description
:01	0x3401 0x0202	Assigns a remote control address according the cabling (0x3401) and informs about the number of horizontal and vertical cubes, and switches off the wall functionality, (0x0202) cf. Monitor wall.



0				2				0				2			
0	0	0	0	0	0	1	0	0	0	0	0	0	0	1	0
Bit 15	Bit 14	Bit 13	Bit 12	Bit 11	Bit 10	Bit 9	Bit 8	Bit 7	Bit 6	Bit 5	Bit 4	Bit 3	Bit 2	Bit 1	Bit 0
Monitor wall on/off == off	Force Black	Number of monitors in Y direction (==2)						Not used	Not used	Number of monitors in X direction == 2					

10 Appendix

10.1 Supported input sources

The following table lists the sources which have been tested.

10.1.1 DVI Input

The adjustments are done automatically

Source	XGA	SXGA	SXGA+
640x350 / 85Hz	OK	OK	OK
640x400 / 85Hz	NOK	NOK	OK
720x350 / 85Hz	OK	OK	n.a
640x480 / 60Hz	OK	OK	OK
640x480 / 72Hz	OK	OK	OK
640x480 / 75Hz	OK	OK	OK
640x480 / 85Hz	OK	OK	OK
800x600 / 56Hz	OK	OK	OK
800x600 / 60Hz	OK	OK	OK
800x600 / 72Hz	OK	OK	OK
800x600 / 85Hz	OK	OK	OK
1024x768 / 60Hz	OK	OK	OK
1024x768 / 70Hz	OK	OK	OK
1024x768 / 75Hz	OK	OK	OK
1024x768 / 85Hz	OK	OK	OK
1152x864 / 75Hz	OK	OK	OK
1280x960 / 60Hz	OK	OK	OK
1280x960 / 85Hz	OK	OK	OK
1280x1024 / 60Hz	OK	OK	OK
1280x1024 / 75Hz	OK	OK	OK
1280x1024 / 85Hz	OK	OK	OK
1600x1200 / 60Hz	OK	OK	NOK

10.1.2 RGB Input

The adjustments are done automatically

Source	XGA	SXGA	SXGA+
640x350 / 85Hz	OK*)	OK*)	OK
640x400 / 85Hz	OK*)	OK*)	OK
720x350 / 85Hz	OK	OK	n.a
640x480 / 60Hz	OK	OK	OK
640x480 / 72Hz	OK	OK	OK
640x480 / 75Hz	OK	OK	OK
640x480 / 85Hz	OK	OK	OK
800x600 / 56Hz	OK	OK	OK
800x600 / 60Hz	OK	OK	OK
800x600 / 72Hz	OK	OK	OK
800x600 / 85Hz	OK	OK	OK
1024x768 / 60Hz	OK	OK	OK
1024x768 / 70Hz	OK	OK	OK
1024x768 / 75Hz	OK	OK	OK
1024x768 / 85Hz	OK	OK	OK
1152x864 / 75Hz	OK	OK	OK
1280x960 / 60Hz	OK	OK	OK
1280x960 / 85Hz	OK*)	OK*)	OK
1280x1024 / 60Hz	OK	OK	OK
1280x1024 / 75Hz	OK	OK	n.a.
1280x1024 / 85Hz	OK*)	OK*)	n.a.
1600x1200 / 60Hz	OK	OK	NOK

*) manual adjustment only

10.1.3 Video Input

The timing is found automatically

	XGA	SXGA	SXGA+
PAL B/ G	OK	OK	OK
PAL D/ K	OK	OK	OK
PAL I	OK	OK	OK
PAL M	OK	OK	OK
PAL N	OK	OK	OK
NTSC 4 B/ G	OK	OK	OK
NTSC 4 D/ K	OK	OK	OK
NTSC 4 I	OK	OK	OK
NTSC M	OK	OK	OK
SECAM B/ G	OK	OK	OK
SECAM D/ K/ K1	OK	OK	OK
SECAM	OK	OK	OK

10.2 All types of RCU

Up to now, three different kind of RCU's have been used for controlling the MultiInput Module. The following chapter shows a picture of each type and explains how it is programmed.

10.2.1 IR Remote Control Type 1

Item	description
1	No function in standard operation; used for re-programming
2	**M**enu key to enter the OSD, to exit a sub menu and/or to close the OSD
3	Up key
4	Right key
5	Down key
6	Left key
All other keys	No function

fter exchanging the cells it might happen that IR Remote Control needs to be re-programmed

Therefore on the IR Remote Control, press the **"Standby"** button and the **M** key together until the red LED on the IR Remote Control is permanent on. Then press in following order:

1
6
6

To quit the programming mode, press the M key on the IR Remote Control.

10.2.2 IR Remote Control Type 2

Item	description
1	**On/off** button, also used for re-programming
2	**OK** button to enter the OSD, to exit a sub menu and/or to close the OSD
3	Up key
4	Right key
5	Down key
6	Left key
All other keys	No function

After exchanging the cells it might happen that IR Remote Control needs to be re-programmed
Make sure that the device is switched on (power switch on the rear side of the device!)
On the IR Remote Control, press the **TV** button
Press the **MAGIC** button until the red LED on the IR Remote Control blinks once and then twice.
Then press in following order:

0
6
2
5

The red LED blinks twice.

Subsequently direct the IR Remote Control to the device and press **Power** key. The programming has been successfull if the device switches on.

10.2.3 IR Remote Control Type 3

Item	description
1	**On/off** button, also used for re-programming
2	**OK** button to enter the OSD, to exit a sub menu and/or to close the OSD
3	Up key
4	Right key
5	Down key
6	Left key
All other keys	No function (except the numeric keys when programming the IR, see below)

To program the IR remote control, press the following keys in the described sequence:

- **simultaneously press the On/Off + OK key for 3 seconds**
- **Use the numeric keys, and enter the code 2 7 0**
- **Press On/Off again.**

For confirmation, the on/off key will blink three times.